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Happiness convergence in transition countries☆

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A B S T R A C T

The "transition happiness gap" has been one of the most robust findings in the literature on life satisfaction. Until very recently, scholars using various datasets have shown that residents of post-communist countries were significantly less satisfied with their lives than their counterparts in non-transition countries (controlling for income and other socio-economic characteristics). The literature has explained this finding by the great macroeconomic instability of the 1990s, by a substantial decrease in the quality and accessibility of public goods, by the major increase in inequality, and by the rapid depreciation of pre-transition human capital. All these factors were expected to subside over time – at least after the post-Great-Recession recovery. In this paper, we consider two most recent datasets – the third wave of the Life in Transition Survey (administered in 2015–16) and the 2010–2016 waves of the annual Gallup World Poll. We find that by 2016 the transition happiness gap had closed. This convergence has taken place both due to a "happiness recovery" in post-communist countries after the Great Recession and due to a decrease in life satisfaction in comparator countries in recent years. We also find that the convergence in life satisfaction was primarily driven by middle-income young, educated individuals, regardless of gender.

1. Introduction

The transition from planned to market economy has been a unique political, social and economic transformation undertaken in a relatively short period of time. In the last twenty-five years, the citizens of former communist countries have lived through a complete overhaul of public and social institutions, the emergence of a new private sector, and the re-integration into the global economy.

While there has been a significant divergence of transition trajectories (in particular, between Central and Eastern Europe, on the one hand, and the Former Soviet Union, on the other), academic research has identified one important common property shared by all post-communist countries: the so-called "transition happiness gap". Residents of former communist countries have been reporting significantly lower life satisfaction than their counterparts in countries with similar income levels that did not undergo the transition from plan to market. Following the decline in incomes in the first years of transition and subsequent economic growth, life satisfaction also partially recovered after its initial fall (see Easterlin, 2014 and Inglehart et al., 2013). However, until very recently, this recovery did not bring life satisfaction in transition countries up to the levels of countries with similar per capita income.[1]

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[1] This finding has been documented in studies using all major international sources of life satisfaction data. Sanfey and Teksoz (2007); Guriev and Zhuravskaya (2009); Easterlin (2009) identify the transition happiness gap in the World Values Survey (the first five waves, up to 2008); Deaton (2008) – in the Gallup World Poll (the first wave, 2006), Djankov et al. (2016) – in the Life in Transition Survey (the first and the second rounds, 2006 and 2010, respectively), Pew Global Attitudes Survey, Eurobarometer, and the European Values Survey.

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Why did residents of transition countries report lower life satisfaction? Economists have been able to identify several common factors contributing to the transition happiness gap. East Europeans' lower life satisfaction may be explained by their dissatisfaction with their governments (Djankov et al., 2016) and their legal systems (Nikolova, 2016). The happiness gap has also been related to the traumatic experience of the macroeconomic instability of early transition, to the deterioration of public goods, and the increase in income inequality during the transition (Guriev and Zhuravskaya, 2009). It may have also been driven by the impact of the depreciation of the human capital stock accumulated under central planning: skills acquired before the transition turned out to be less useful in the market economy (Guriev and Zhuravskaya, 2009).

This analysis has predicted that the transition happiness gap should eventually disappear.[2] As the quality of public services improves and younger and newly educated cohorts enter the labor market, post-communist countries should be converging to their non-transition peers in terms of life satisfaction. This convergence has been delayed (or slowed down) by the Great Recession that has had a disproportionally strong impact on the post-communist countries. However, the post-crisis recovery and the introduction of the more resilient macroeconomic framework (macroprudential regulation and inflation targeting) should contribute to eliminating the transition happiness gap and prevent further large macroeconomic shocks in the future.

In this paper, we re-evaluate the impact of transition on life satisfaction using the newly available data from the third round of the Life in Transition Survey (LiTS III) and the 2010–2016 waves of the annual Gallup World Poll. We find that the happiness gap has closed: the residents of post-communist countries are no longer less satisfied with life than their peers, living in countries that have similar levels of income but did not undergo the transition from plan to market. We also find that this result is primarily driven by the convergence in life satisfaction among the younger cohorts.

The rest of the paper is structured as follows. Section 2 describes the data and the empirical strategy. Section 3 presents the results and provides robustness checks. Section 4 concludes.

2. Data and methodology

2.1. Data

In this paper, we use data from the Life in Transition Survey (LiTS) and from the Gallup World Poll (GWP).

The Life in Transition Survey has been conducted by the European Bank for Reconstruction and Development and by the World Bank in 2006 (first wave), 2010 (second wave) and in the end of 2015 and the beginning of 2016 (third wave). We mostly use the third wave (LiTS III) which was administered in 29 former communist countries (excluding Turkmenistan) and five comparator countries (Germany, Italy, Turkey, Greece, and Cyprus). Over 2500 localities were visited, and over 51,000 interviews were completed with randomly selected households. The survey was representative at the country level.

The survey includes questions on economic well-being, beliefs, attitudes, and life satisfaction. The latter is our main variable of interest. The respondents were asked whether they agree with the statement *"All things considered, I am satisfied with my life now"*. They could choose among five options: "strongly disagree", "disagree", "neither agree nor disagree", "agree" and "strongly agree", thus, creating a five-point scale for the degree of life satisfaction. We also created a binary measure of life satisfaction, assuming the respondents to be satisfied with their life if they chose "agree", and "strongly agree" and dissatisfied with their life otherwise.

We also use the data from 2010 to 2016 waves of the annual Gallup World Poll. We exclude the years prior to 2010 because all the variables of interest are available only for a limited number of countries.[3] The data covers 31 post-communist countries and territories (including Nagorno-Karabakh) and 133 comparator countries with approximately 450,000 observations for which we have all the variables of interest. For each country-year Gallup typically surveys 1000 randomly selected individuals, constituting a nationally representative sample.[4]

Similarly to LiTS, the Gallup World Poll includes multiple questions on attitudes, beliefs, objective and perceived socio-economic well-being. Our main question of interest is formulated in the following way: "*Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?*".

2.2. Methodology

Our analysis of the transition happiness gap is based on the conventional econometric model of life satisfaction:

$$life\ \ satisfaction_{ic} = \beta \cdot \mathbb{1}\{post{-}communist\ \ country\}_c + X'_{ic}\gamma + \varepsilon_{ic}, \tag{1}$$

where the measure of life satisfaction for individual i in country c is regressed on an indicator that takes the value of one if c is a

[2] Nikolova (2016) finds no significant difference in life satisfaction between transition and non-transition countries already in the sixth wave of the World Values Survey (2010–13). However, this result may be driven by the small number of observations as this wave only includes 13 transition countries.

[3] Only 17 post-communist countries have all the data for 2009; this number increases to 25 for 2010.

[4] However, the residents of certain countries are not surveyed on an annual basis. For this reason, in some specification we only consider a panel of countries, for which GWP has data for all years; this panel includes 23 post-communist countries and 40 non-transition countries. The full list of countries for which all the data is available in a given year is presented in the appendix.

former communist country and on a vector of individual characteristics that capture the conventional determinants of life satisfaction (Clark et al., 2017) that can be proxied by variables available in LiTS and GWP. These include age and age squared (or, alternatively, birth-year dummies), as well as income, education, gender, marital status, the number of children in the household, urban rather than rural residence, and employment status. Standard errors are clustered at the country level.

The coefficient β represents the effect of living in a former communist country on life satisfaction (controlling for conventional individual- and household-level determinants of happiness). If β is negative and significant, this means that the "transition happiness gap" is still present; if there is no significant negative effect, then the gap has closed.

We also consider the following modifications of the model:

$$life\ \ satisfaction_{ic} = \sum_{\mathcal{B}} \varphi_{\mathcal{B}} \cdot \mathbb{1}\{post{-}communist\ \ country\}_c \cdot \mathbb{1}\{birth\ \ year \in \mathcal{B}\}_{ic} + \mathcal{X}'_{ic}\gamma + \varepsilon_{ic}, \tag{2}$$

$$life\ \ satisfaction_{ic} = \sum_{\mathcal{E}} \psi_{\mathcal{E}} \cdot \mathbb{1}\{post{-}communist\ \ country\}_c \cdot \mathbb{1}\{education \in \mathcal{E}\}_{ic} + \mathcal{X}'_{ic}\gamma + \varepsilon_{ic}, \tag{3}$$

$$life\ \ satisfaction_{ic} = \sum_{\mathcal{G}} \mu_{\mathcal{G}} \cdot \mathbb{1}\{post{-}communist\ \ country\}_c \cdot \mathbb{1}\{gender \in \mathcal{G}\}_{ic} + \mathcal{X}'_{ic}\gamma + \varepsilon_{ic}, \tag{4}$$

$$life\ \ satisfaction_{ic} = \sum_{\mathcal{I}} \theta_{\mathcal{I}} \cdot \mathbb{1}\{post{-}communist\ \ country\}_c \cdot \mathbb{1}\{income \in \mathcal{I}\}_{ic} + \mathcal{X}'_{ic}\gamma + \varepsilon_{ic}, \tag{5}$$

where $\mathcal{B}$ represents various groups of birth years (or age), $\mathcal{I}$ – income groups, $\mathcal{G}$ – gender, and $\mathcal{E}$ denotes the highest level of education, completed by the respondent. This setting allows us to study, whether or not the closing of the transition happiness gap was uniform across age, education, and income categories.

3. Results

3.1. Main results: the closing of the transition happiness gap

3.1.1. Results from the Life in Transition Survey

The LiTS III data show that there is no longer a gap between post-communist countries and comparator countries in terms of life satisfaction. Fig. 1 reports the regional averages of life satisfaction levels by country groups (for the binary measure of life satisfaction). The Central Asian countries report very high levels of life satisfaction. Central Europe and Baltics (CEB) are roughly at par with Germany and Italy. South-Eastern Europe (SEE), Eastern Europe and the Caucasus (EEC) and Russia have life satisfaction levels similar to those of Cyprus, Greece and Turkey.[5]

The average level of life satisfaction in post-communist countries is 50% – well below that of Germany and Italy (61%). However, this difference is fully explained by the fact that transition countries have a lower income per capita. Fig. 2 presents the share of residents satisfied with their life and countries' per capita GDP in 2015. Except for three outliers (the Kyrgyz Republic, Tajikistan, and Uzbekistan), there is a strong positive correlation between the level of development and life satisfaction. Even without the Kyrgyz Republic, Tajikistan and Uzbekistan – that report unusually high levels of life satisfaction given their per capita incomes – life satisfaction in post-communist countries is not lower than in other countries with similar income levels. In 2015–16, controlling for per capita income, there is no significant difference between post-communist and comparator countries. This result is not driven by any single country including Greece (where life satisfaction is substantially below the trend) or Germany (where life satisfaction is a little above the trend).

Fig. 2 shows that the "happiness convergence" has taken place both due to the substantial increase in life satisfaction in most former communist countries and due to the decrease in life satisfaction in comparator countries between 2010 and 2016. In Germany and Turkey, life satisfaction has declined despite income growth. In Italy, life satisfaction declined alongside the fall in GDP per capita, but the decrease in life satisfaction was more pronounced than the fall in GDP would predict. Greece and Cyprus were not covered by LiTS in 2010, but their current life satisfaction levels are lower than those implied by their per capita incomes. In 2010 the picture was completely different: relative to transition countries, life satisfaction in all Western countries was significantly higher than their income would suggest (except for Italy where it was on the trend line).

Taken together, these results can be interpreted in the following way. In 2010, the transition happiness gap was still present. It may well be the case that it could have disappeared already by 2010 as was predicted by the literature but the disproportionally high impact of the Great Recession on the former communist countries resulted in a pronounced negative effect on life satisfaction (EBRD, 2016, ch. 1). Since 2010, life satisfaction in these countries has strongly recovered, while comparator countries have suffered from a prolonged stagnation, converging down to their post-communist counterparts.

The absence of the transition happiness gap is confirmed by econometric tests. These tests (reported in Table 1) are based on a

[5] In EBRD classification, Central Asia includes Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, and Uzbekistan; Central Europe and the Baltics includes Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic, and Slovenia; South-Eastern Europe includes Albania, Bosnia and Herzegovina, Bulgaria, FYR Macedonia, Kosovo, Montenegro, Romania, and Serbia; Eastern Europe and the Caucasus includes Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine.

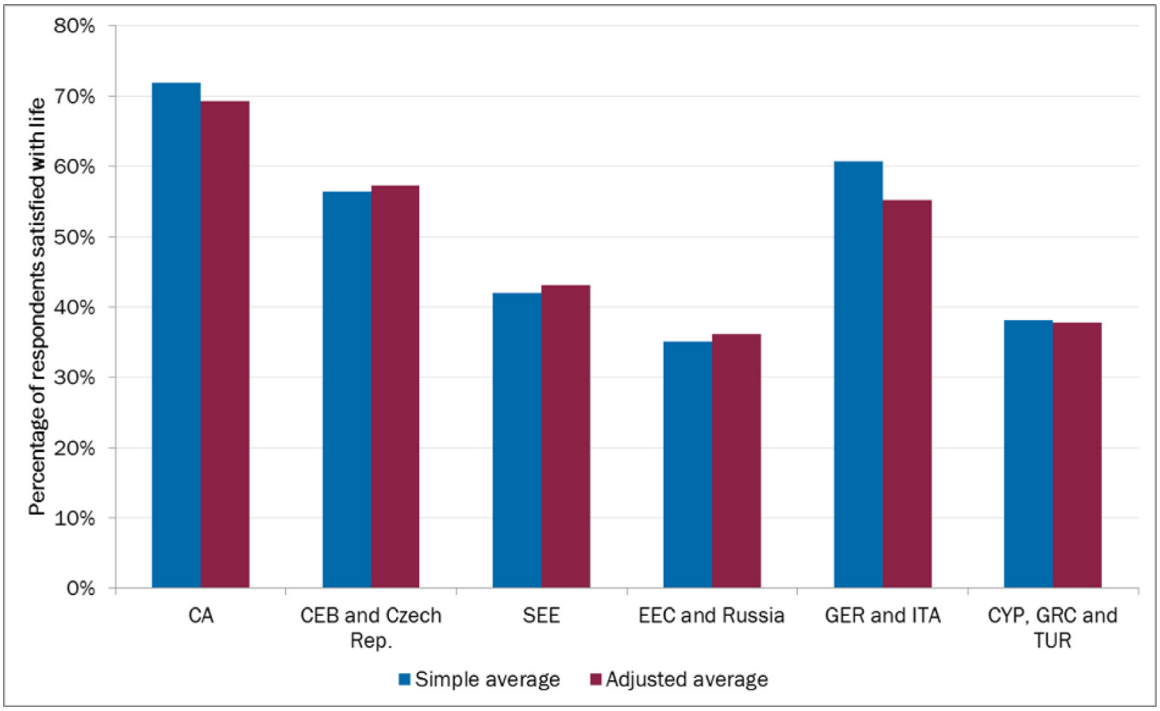

Fig. 1. Life satisfaction by region, LiTS. *Source*: LiTS III and authors' calculations.

Notes: The figure shows the percentage of respondents that agree or strongly agree with the statement "*All things considered, I am satisfied with my life now*." In all cases, the first of the two bars indicates simple regional averages. The second represents the level of life satisfaction adjusted for individual and household characteristics (see Table 1 below). The average for SEE does not include Cyprus and Greece, which are shown separately with Turkey in the last two bars.

conventional model of life satisfaction (1). Columns (1.2) and (1.4) report the results for regressions that include self-reported household income per capita (logarithm), while columns (1.3) and (1.5) report the same results for two proxies for income: answers to questions whether the household can afford holidays and meat, chicken or fish and whether the household can afford unexpected expenses.

Table 1 reports the results for the binary measure of life satisfaction (whether the respondent is satisfied with life or not); the results for a five-point measure of life satisfaction are very similar (we report them in Section 3.3).

The effects of the variables in Table 1 are intuitive and consistent with the literature on life satisfaction. Each additional level of education (i.e., moving from no education to primary education, from primary to secondary, and from secondary to tertiary) increases the probability of being satisfied with life by 5–10 percentage points. Being unemployed decreases life satisfaction by 12–19 percentage points. A 10% increase in income increases the probability of being satisfied with life by 1 percentage point. Women are 2–3 percentage points happier than men. Married individuals are 2 percentage points more likely to be satisfied with life than single ones, while divorced or separated people are 4–7 percentage points less likely to be happy. Each additional child increases the probability of happiness by 2–3 percentage points.[6] The effect of age is non-linear – for those under 50 life satisfaction decreases with age, while for those older than 50 years it starts to increase with age. Table 1 presents the results with linear and squared terms for age; the results with birth year dummies are very similar.[7]

The main variable of interest in Table 1 is residence in a post-communist country. The coefficient for this variable is not statistically significant in any of the specifications. Thus, life satisfaction in post-communist countries is the same as in the sample of comparator countries (controlling for other determinants of life satisfaction).

Columns (1.1)–(1.3) compare post-communist countries with Western Europe (Germany and Italy). Column (1.1) reports the results without controlling for respondents' income. In this specification, life satisfaction in Germany and Italy is 5 percentage points higher, but the effect is not statistically significant. Once income is controlled for, there is no difference in life satisfaction between Western and post-communist countries (columns (1.2) and (1.3)).

Columns (1.4) and (1.5) compare post-communist countries with all the five comparator countries in the sample (Germany, Italy, Turkey, Greece, and Cyprus). On average, life satisfaction in post-communist countries is higher than in these five countries

[6] If we replace the household income per capita with total household income, the coefficient for the number of children becomes negative; these results are available on request.

[7] We do not report the coefficients on religion. They are in line with the findings of Djankov and Nikolova (2018) who in particular find a negative relationship between Eastern Orthodox religion and life satisfaction – as well as we do in both LiTS and GWP data.

Table 1
The transition happiness gap, LiTS.

	Life Satisfaction				
	(1.1)	(1.2)	(1.3)	(1.4)	(1.5)
Post-communist	−0.051	0.007	−0.032	0.071	0.021
	(0.123)	(0.111)	(0.105)	(0.070)	(0.066)
Log Household Income per Capita		0.103***		0.108***	
		(0.028)		(0.028)	
Can Afford Holidays and Meat			0.188***		0.191***
			(0.014)		(0.013)
Can Afford Unexpected Expenses			0.130***		0.126***
			(0.010)		(0.010)
Female	0.016***	0.027***	0.027***	0.026***	0.025***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Age/10	−0.099***	−0.119***	−0.102***	−0.112***	−0.097***
	(0.016)	(0.016)	(0.014)	(0.020)	(0.018)
$Age^2/100$	0.009***	0.011***	0.010***	0.011***	0.010***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)
Primary Education	0.118***	0.107***	0.104***	0.084***	0.082***
	(0.030)	(0.029)	(0.028)	(0.027)	(0.026)
Secondary Education	0.207***	0.181***	0.152***	0.155***	0.127***
	(0.034)	(0.034)	(0.030)	(0.033)	(0.029)
Tertiary Education	0.298***	0.248***	0.192***	0.219***	0.167***
	(0.034)	(0.036)	(0.028)	(0.037)	(0.028)
Unemployed	−0.190***	−0.135***	−0.124***	−0.124***	−0.116***
	(0.018)	(0.022)	(0.015)	(0.022)	(0.014)
Number of Children	0.019**	0.042***	0.026***	0.046***	0.027***
	(0.007)	(0.009)	(0.007)	(0.009)	(0.007)
Married	0.039***	0.050***	0.018*	0.043***	0.015
	(0.011)	(0.012)	(0.010)	(0.016)	(0.012)
Divorced/Separated	−0.071***	−0.065***	−0.068***	−0.072***	−0.069***
	(0.013)	(0.014)	(0.012)	(0.016)	(0.012)
Widow[er]	−0.047***	−0.044***	−0.040***	−0.058***	−0.047***
	(0.015)	(0.015)	(0.014)	(0.018)	(0.015)
Urban	−0.036***	−0.053***	−0.048***	−0.060***	−0.055***
	(0.012)	(0.014)	(0.011)	(0.016)	(0.013)
Log GDP per Capita	0.026	−0.033	−0.014	−0.038	−0.015
	(0.043)	(0.043)	(0.040)	(0.045)	(0.042)
Observations	44448	35079	44448	38664	48857

Source: LiTS III, World Development Indicators and authors' calculations.

Notes: Linear probability model. Standard errors in parentheses are clustered at the country level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Income is self-reported in local currency and then converted to US dollars. In all regressions we additionally control for religion; the coefficients at these variables are statistically significant. *Number of children* is the number of children under 18 currently living in the house. Specifications (1.1)-(1.3) include 29 post-communist countries, Germany and Italy. Specifications (1.4)-(1.5) also include Cyprus, Greece, and Turkey.

(especially controlling for income); however, the effect is not significant. All specifications above include the Kyrgyz Republic, Tajikistan, and Uzbekistan; a model excluding these countries produces similar results.

Table 2 demonstrates how life satisfaction has changed since the second round of the Life in Transition Survey (LiTS II) that was carried out in 2010. Columns (2.1) and (2.2) reproduce the cross-section results for LiTS II and III, respectively, while column (2.3) reports the results for the pooled cross-section of LiTS II & III. Comparator countries include France, Germany, Italy, Sweden, Turkey, and the United Kingdom for LiTS II; Cyprus, Germany, Greece, Italy, and Turkey for LiTS III. Columns (2.4)–(2.6) reproduce the same regressions but consider a panel of primary sampling units (PSUs) which have observations both for 2010 and for 2016. This automatically creates a panel of countries, consisting of 29 post-communist countries and three comparator countries (Germany, Italy, and Turkey). Finally, column (2.7) reports the results for the same regression as in (2.6), additionally controlling for PSU fixed effects.[8]

The results confirm that by 2016 the transition happiness gap had closed. Notably, columns (2.4)–(2.6) are very similar to columns (2.1)–(2.3), although the former consider a panel of PSUs. Columns (2.4) and (2.5) show that, although in 2010 the residents of post-communist countries were 23 percentage points less likely to be satisfied with life than the residents of Germany, Italy, and Turkey, by 2016 this difference had disappeared.[9] In turn, columns (2.6) and (2.7) suggest that the convergence was achieved due to

[8] The small number of observations for LiTS II is explained by the fact that in 2010 the respondents were not asked a direct question about the income of their household. Instead, income is calculated as the sum of reported savings and expenses on several categories of goods and services. To make the data comparable across observations, income is coded as missing if the answer to at least one of those questions is not present.

[9] Notice that the 23 percentage points gap observed in 2010 was indeed very large. As the coefficient for the logarithm of household income per capita is 0.10–0.11, in order to catch-up with their peers in the non-transition countries, the residents of post-communist countries would have to increase their logarithm of income by about 2 – i.e. multiply income itself by $\exp(2) = 7.4$. However, given the problems with constructing the

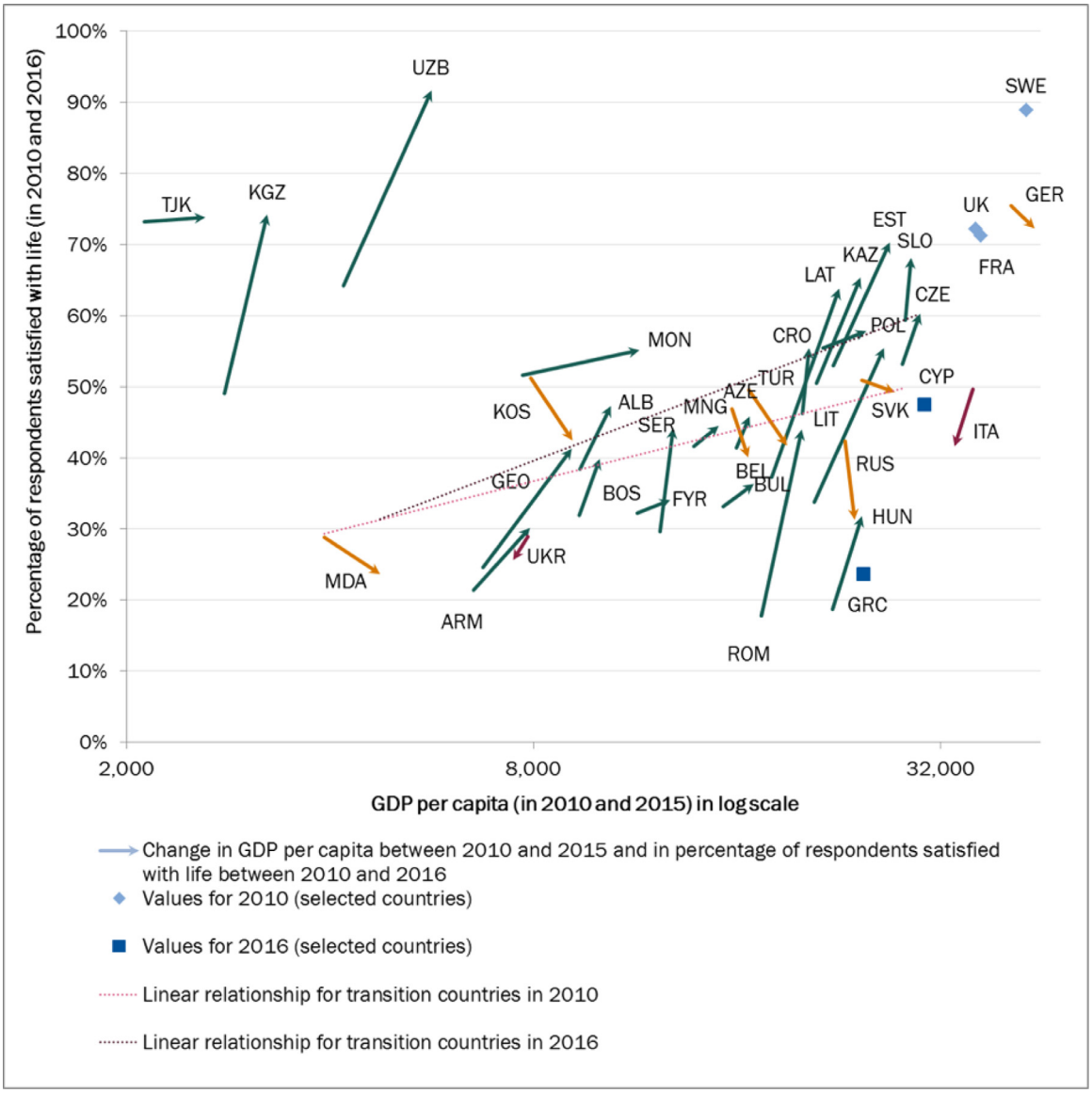

Fig. 2. Life satisfaction and GDP per capita in transition and comparator countries, LiTS. *Source*: LiTS, rounds II and III, World Development Indicators and authors' calculations.

Notes: The vertical axis shows the percentage of respondents that agree or strongly agree with the statement "*All things considered, I am satisfied with my life now*". The horizontal axis shows the GDP per capita in PPP terms (constant 2011 international dollars) in logarithmic scale. Arrows show the change in average GDP per capita between 2010 and 2015 and in the percentage of respondents satisfied with their life between 2010 and 2016. The dotted lines represent the linear relationship for former communist countries (excluding three outliers: Kyrgyz Republic, Tajikistan, and Uzbekistan) in 2010 and 2016.

a substantial decrease in life satisfaction in non-transition countries, while the residents of post-communist countries either experienced a decrease of a smaller magnitude or did not experience it at all.[10]

Overall, these results imply that in terms of life satisfaction, there is no longer a statistically significant difference between countries that experienced the transition from plan to market and those that did not.

(*footnote continued*)
income variable in LITS II, this back-of-the-envelope calculation should be treated with caution. The Gallup data below provide a more reliable estimate for 2010.

[10] In column (2.7), the PSU dummies automatically absorb country-level variables, including the post-communist dummy. The results are similar to the ones in (2.6): life satisfaction in non-post-communist countries declined by 33.9 percentage points between 2010 and 2016, while in post-communist countries the decline was 9.6 percentage points smaller.

Table 2
The transition happiness gap, LiTS.

	Life Satisfaction						
	(2.1)	(2.2)	(2.3)	(2.4)	(2.5)	(2.6)	(2.7)
Post-communist	−0.211***	0.070	−0.235***	−0.223***	0.085	−0.228***	
	(0.053)	(0.069)	(0.053)	(0.076)	(0.089)	(0.079)	
Year = 2016			−0.368***			−0.351***	−0.339***
			(0.058)			(0.059)	(0.047)
Post-communist × Year = 2016			0.307***			0.310***	0.096*
			(0.065)			(0.070)	(0.051)
Source	LiTS II	LiTS III	LiTS II & III	LiTS II	LiTS III	LiTS II & III	LiTS II & III
PSU panel	No	No	No	Yes	Yes	Yes	Yes
PSU fixed effects	No	No	No	No	No	No	Yes
Observations	7908	38664	46572	5264	25055	30319	30319

Source: LiTS II & III, World Development Indicators and authors' calculations.

Notes: Linear probability model. Standard errors in parentheses are clustered at the country level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. In all the regressions we control for log household income, employment status, gender, age group, the highest completed level of education, the number of children, marital status, religion, urban/rural status, and log GDP per capita. The coefficients for these variables are statistically significant and similar to those reported in Table 1. For LiTS III income is self-reported in local currency and then converted to US dollars. For LiTS II income is calculated as the sum of reported spending and savings and then converted to US dollars. *Number of children* is the number of children under 18 currently living in the house. LiTS II has data only on the age group of the respondents; LiTS III data is adjusted accordingly. Specifications (2.1)–(2.3) include 29 post-communist countries and all the comparator countries for each respective dataset. Specifications (2.4)–(2.6) include a panel of primary sampling units (PSUs) which were present both in LiTS II and in LiTS III. These cover 29 post-communist countries, Germany, Italy, and Turkey. The final specification (2.7) considers the panel of PSUs and adds PSU fixed effects.

3.1.2. Results from the Gallup World Poll

While LiTS includes almost every single post-communist country in each wave (except Turkmenistan), its set of comparators countries is very small. In particular, when we consider a panel of PSUs, the data is available only for Germany, Italy, and Turkey. In turn, the data from the Gallup World Poll allows us to confirm our findings for a wider range of non-transition countries.[11] Because our aim is to compare life satisfaction across countries with similar income levels, we only consider countries with PPP adjusted GDP per capita no greater than US$ 35,000, a level that has never yet been reached by any post-communist country, although Czech Republic is close with a GDP per capita of US$ 34,700.[12] Given this specification, the comparator group includes more than 40 countries, even if we require the data for them to be available during all the years from 2010 to 2016. Without this restriction, the number of comparator countries increases to more than 60.

Fig. 3 presents the linear and non-linear non-parametric (lowess) relationship between average life satisfaction and GDP per capita among transition and non-transition countries for 2010 and 2016. While in 2010 the vast majority of post-communist countries was below the trend line, this was no longer the case in 2016. In fact, half post-communist countries experienced lower life satisfaction than predicted by their income, while the other half was above the trend line.[13]

Given the Gallup World Poll is conducted on a yearly basis, we can also track the evolution of the transition happiness gap over time. In order to do so, we estimate model (1) for each year from 2010 to 2016. The results are reported in Table 3.

The results presented in Table 3 are consistent with those from the Life in Transition Survey: we find that in 2010 residents of post-communist countries still remained less satisfied with life than the residents of comparator countries, but by 2016 this difference had disappeared. The closing of the transition happiness gap is estimated to have taken place in 2012–2013, depending on the exact specification of the econometric model. In the standard specification, we consider all the countries for which the data are available in a given year, regardless of whether the data are available in other years. These results are presented in columns (3.1)–(3.7). We also run the same regressions for the subset of countries with data available for all years from 2010 to 2016 (the respective results are presented in columns (3.8)–(3.14)). The results do not change. If anything, the transition happiness gap is estimated to close a year earlier if such a panel is considered.

Fig. 4 depicts the evolution of the transition happiness gap from 2010 to 2016, using the results from columns (3.1) to (3.7). The solid line represents the absolute value of the difference between life satisfaction for post-communist and comparator countries, while the dashed lines denote the boundaries of the 95% confidence interval.

Notice that the magnitude of the 2010 transition happiness gap in 2010 was quite large. The coefficient of 0.35 for the post-communist dummy in column (3.1) implies that a household in a post-communist country would need to more than double its per capita income to catch up with a similar household in a non-transition country: as the coefficient for the logarithm of household

[11] The exact number depends on the specification. However, even in the most restrictive cases, there are 40 non-transition countries with levels of development comparable to those of the post-communist countries.

[12] We discuss the comparisons with rich countries in Section 3.3.

[13] Fig. 3 includes all the countries with data available for 2010 and/or 2016. In the Appendix, we show that the figure for the panel of countries (i.e. the subset of countries surveyed *both* in 2010 and 2016) is similar.

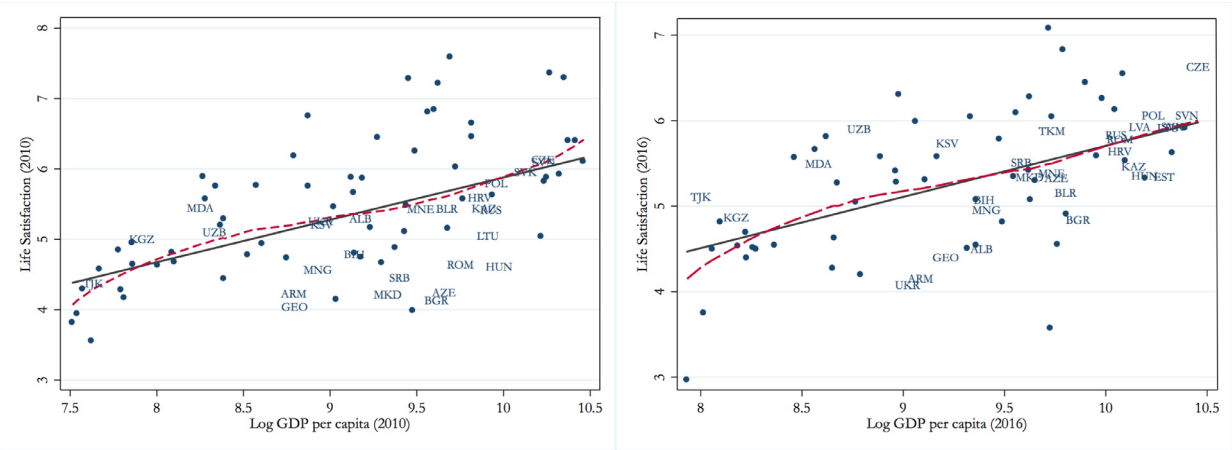

Fig. 3. Life satisfaction and GDP per capita in transition and comparator countries, GWP. *Source*: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: The vertical axis shows the average response the residents of a country give to the question "*Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?*". The horizontal axis shows the GDP per capita in PPP terms (constant 2016 international dollars) in logarithmic scale. Post-communist countries are labeled, dots represent comparator countries. The solid line represents the linear relationship, while the dashed line represents the nonparametric, locally weighted regressions (lowess). Each part of the figure considers a cross-section of countries with income levels similar to post-communist countries.

income is 0.41, the compensating differential in the logarithm of income would have to be $0.35/0.41 = 0.85$, implying that household per capita income itself needs to increase by a multiple of $\exp(0.85) = 2.34$.

3.2. Heterogeneous effects

3.2.1. Transition happiness gap by age cohorts

In this subsection, we explore whether or not the closure of the transition happiness gap was uniform across age groups and birth cohorts.

In order to address this question we first consider model (1) simultaneously for 2010 and 2016, excluding the indicator for residence in a post-communist country, age and age squared from the regression, and then nonparametrically assess the size of the residual for transition and comparator countries for each birth year, using locally weighted scatterplot smoothing (lowess). Thus, the difference between the two curves denotes the transition happiness gap for a given birth year. In turn, as we simultaneously include observations for 2010 and 2016, the residual curves can also be compared across years, allowing us to assess the change in life satisfaction for a particular age group both in transition and non-transition countries. The results are presented in Fig. 5 with the solid and dashed lines corresponding to the residents of post-communist and comparator countries, respectively.[14]

We find that by 2010 the transition happiness gap had already disappeared for the younger cohorts (this is perfectly consistent with Guriev and Zhuravskaya, 2009). If anything, residents of post-communist countries born after 1990 were slightly more satisfied with their lives than their peers from countries that did not experience the transition. However, the gap was present and very large for the older generations, following a U-shape with the lowest point at the birth year of 1947 – the cohort that turned 63 in 2010. The non-transition countries' age profile of life satisfaction also has a U-shape form with the minimum reached somewhere between 30 and 40 years of age – and a much smaller gap in happiness between young and middle-aged.

The second part of Fig. 5 shows that by 2016 the curve for post-communist countries had shifted to the right and become slightly flatter, while the curve for non-transition countries had shifted downwards, denoting a general decrease in life satisfaction. As a result, the birth year with a zero transition happiness gap shifted from 1987 to 1970 and all individuals generally experienced a convergence in life satisfaction. The noticeable downwards shift of the curve for non-transition countries suggests that the residents of these countries experienced a decrease in life satisfaction. In turn, the curve for post-communist countries remained practically the same as in 2010.

The findings presented in Fig. 5 are confirmed when we estimate the size of the transition happiness gap for various birth year cohorts. Specifically, we consider model (2), that, in addition to age and age squared, also includes interaction terms of $\mathbb{1}\{post\text{–}communist\ \ country\}_c \cdot \mathbb{1}\{birth\ \ year \in \mathcal{B}\}_{ic}$ for various birth year groups $\mathcal{B}$. Thus, the results can be directly compared with those in Table 3. We use six-year birth-year groups to facilitate the comparisons across waves by both birth-year and age. For example, the

[14] Here and further in this section, we report the results for the panel of countries with data from 2010 to 2016.

Table 3
The evolution of the transition happiness gap, GWP.

	Life Satisfaction										Life Satisfaction			
	(3.1)	(3.2)	(3.3)	(3.4)	(3.5)	(3.6)	(3.7)	(3.8)	(3.9)	(3.10)	(3.11)	(3.12)	(3.13)	(3.14)
Year	2010	2011	2012	2013	2014	2015	2016	2010	2011	2012	2013	2014	2015	2016
Post-communist	−0.350**	−0.369**	−0.188	−0.051	−0.041	−0.083	−0.168	−0.317**	−0.268	−0.050	0.030	−0.070	−0.133	−0.144
	(0.135)	(0.147)	(0.165)	(0.157)	(0.136)	(0.125)	(0.135)	(0.155)	(0.166)	(0.194)	(0.196)	(0.157)	(0.140)	(0.155)
Log Household Income per Capita	0.408***	0.405***	0.379***	0.396***	0.377***	0.378***	0.354***	0.427***	0.477***	0.399***	0.401***	0.426***	0.455***	0.447***
	(0.034)	(0.037)	(0.038)	(0.034)	(0.032)	(0.029)	(0.032)	(0.041)	(0.046)	(0.052)	(0.050)	(0.042)	(0.045)	(0.042)
Unemployed	−0.503***	−0.528***	−0.537***	−0.514***	−0.430***	−0.517***	−0.472***	−0.549***	−0.572***	−0.527***	−0.603***	−0.516***	−0.602***	−0.589***
	(0.063)	(0.067)	(0.054)	(0.067)	(0.053)	(0.053)	(0.061)	(0.078)	(0.083)	(0.071)	(0.087)	(0.074)	(0.069)	(0.078)
Secondary Education	0.374***	0.361***	0.383***	0.423***	0.392***	0.385***	0.353***	0.400***	0.274***	0.423***	0.443***	0.378***	0.371***	0.309***
	(0.053)	(0.052)	(0.042)	(0.054)	(0.053)	(0.050)	(0.049)	(0.064)	(0.059)	(0.043)	(0.063)	(0.063)	(0.066)	(0.062)
Tertiary Education	0.690***	0.657***	0.655***	0.776***	0.759***	0.727***	0.712***	0.694***	0.566***	0.728***	0.795***	0.770***	0.728***	0.673***
	(0.059)	(0.068)	(0.053)	(0.070)	(0.078)	(0.063)	(0.066)	(0.070)	(0.080)	(0.059)	(0.089)	(0.084)	(0.077)	(0.073)
Log GDP per Capita	0.278***	0.225***	0.259***	0.234***	0.292***	0.233***	0.321***	0.128	−0.042	0.131	0.176	0.145	0.139	0.166
	(0.074)	(0.075)	(0.075)	(0.073)	(0.069)	(0.063)	(0.065)	(0.101)	(0.089)	(0.098)	(0.109)	(0.095)	(0.087)	(0.101)
Female	0.099***	0.171***	0.189***	0.184***	0.198***	0.183***	0.134***	0.102***	0.203***	0.169***	0.167***	0.178***	0.197***	0.136***
	(0.032)	(0.038)	(0.040)	(0.031)	(0.032)	(0.033)	(0.032)	(0.034)	(0.048)	(0.039)	(0.039)	(0.039)	(0.042)	(0.043)
Age/10	−0.391***	−0.459***	−0.365***	−0.386***	−0.537***	−0.495***	−0.544***	−0.443***	−0.545***	−0.451***	−0.436***	−0.621***	−0.607***	−0.588***
	(0.068)	(0.063)	(0.056)	(0.066)	(0.072)	(0.062)	(0.068)	(0.080)	(0.083)	(0.085)	(0.084)	(0.090)	(0.083)	(0.092)
$Age^2/100$	0.036***	0.044***	0.034***	0.036***	0.051***	0.045***	0.052***	0.041***	0.053***	0.040***	0.038***	0.057***	0.055***	0.053***
	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)	(0.010)
Small Town	0.011	0.062	−0.008	0.078	0.072	0.041	−0.020	0.049	0.142	−0.019	0.111	−0.034	0.064	−0.003
	(0.078)	(0.071)	(0.066)	(0.082)	(0.070)	(0.051)	(0.063)	(0.090)	(0.085)	(0.087)	(0.113)	(0.098)	(0.066)	(0.068)
Suburb of Large City	0.006	−0.141	0.017	−0.025	−0.100	−0.118	0.007	0.067	−0.201	0.022	0.042	−0.201	−0.173	0.018
	(0.113)	(0.103)	(0.091)	(0.116)	(0.104)	(0.094)	(0.087)	(0.149)	(0.139)	(0.134)	(0.177)	(0.152)	(0.113)	(0.109)
Large City	0.197***	0.189***	0.110*	0.135	0.122*	0.115*	0.204***	0.212***	0.254***	0.152**	0.163	0.084	0.163**	0.226***
	(0.070)	(0.069)	(0.063)	(0.083)	(0.072)	(0.065)	(0.069)	(0.078)	(0.092)	(0.074)	(0.108)	(0.089)	(0.081)	(0.081)
Countries	87	105	106	102	111	102	99	63	63	63	63	63	63	63
Post-Communist Countries	25	30	30	29	30	30	29	23	23	23	23	23	23	23
Panel of Countries	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	56,584	68,856	85,307	61,381	69,067	59,738	58,447	41,518	41,669	52,200	36,869	38,717	36,092	35,835

Source: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: Standard errors in parentheses are clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. In all the regressions we additionally control for the number of children, marital status, religion, and the country's involvement in a military conflict or war. All these specifications consider countries that have GDP per capita no higher than US$ 35,000 (PPP, 2016).

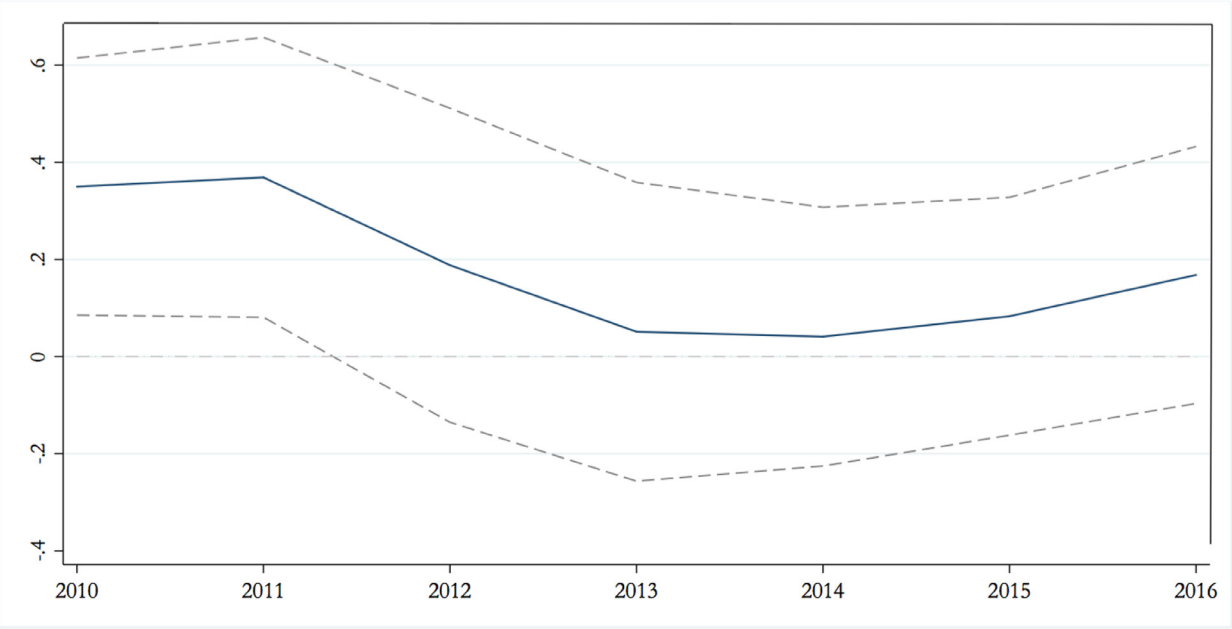

Fig. 4. The evolution of the transition happiness gap, GWP. *Source*: Gallup World Poll and authors' calculations.

Notes: The solid line shows the absolute value of the difference between life satisfaction in transition and non-transition countries. The dashed lines represent the boundaries of the 95% confidence interval. The figure represents the estimates of columns (3.1)–(3.7).

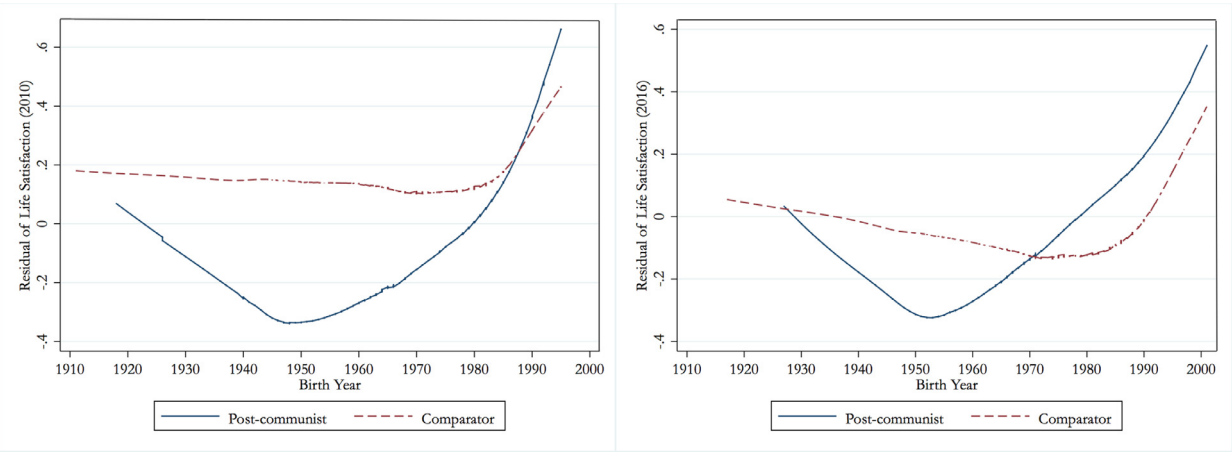

Fig. 5. The transition happiness gap by birth year, GWP. *Source*: Gallup World Poll and authors' calculations.

Notes: We consider the panel of countries with data for 2010–2016 (23 post-communist and 40 comparator countries). The solid line represents the average value of the residual of life satisfaction for post-communist countries, the dashed line – for comparator countries. The birth year specific transition happiness gap is the difference between the two lines.

cohort born in 1985–90 had the same age in 2010 as the next cohort – born in 1991–96 – when surveyed in 2016. Table 4 presents our findings.[15]

By 2010 the transition happiness gap had fully closed only for individuals born in 1979 or later. All the other residents of post-communist countries remained significantly less satisfied with life than their non-transition peers, with the gap reaching its maximum for the birth year around 1950. In turn, by 2016 a significant difference in life satisfaction had persisted only for individuals born around 1950, although the gap had only narrowly closed for adjacent age groups. Therefore, the happiness convergence took place across nearly all age groups, although for the old this result is both less prominent and less robust. This result is not surprising because, as suggested by Fig. 5, the closure of the happiness gap was mainly driven by the residents of comparator countries

[15] We only report the results related to residence in a post-communist country. The coefficients and standard errors for the other variables are very similar to those reported in Table 3.

Table 4
The transition happiness gap by birth year group, GWP.

	Year of Birth									
	> 1996	1991–1996	1985–1990	1979–1984	1973-1978	1967–1972	1961–1966	1955–1960	1949–1954	< 1949
THG (2010)	–	0.347*	−0.134	−0.250	−0.287*	−0.331**	−0.395**	−0.541***	−0.638***	−0.598***
		(0.185)	(0.157)	(0.157)	(0.161)	(0.163)	(0.167)	(0.172)	(0.182)	(0.192)
THG (2016)	0.317	−0.038	−0.057	−0.078	−0.108	−0.148	−0.291	−0.314	−0.578***	−0.452
	(0.203)	(0.161)	(0.151)	(0.167)	(0.155)	(0.157)	(0.182)	(0.194)	(0.195)	(0.279)

Source: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: Standard errors in parentheses are clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
In all the regressions we additionally control for log household income per capita, employment status, education level, log GDP per capita, urban/rural status, gender, the number of children, marital status, religion, and the country's involvement in a military conflict or war. The coefficients for these variables are significant and similar to those reported in Table 3. We consider all countries that have GDP per capita no higher than US$ 35,000 (PPP, 2016) as comparators.

Table 5
Education and the transition happiness gap, GWP.

	Life Satisfaction						
	(5.1)	(5.2)	(5.3)	(5.4)	(5.5)	(5.6)	(5.7)
Year	2010	2011	2012	2013	2014	2015	2016
Post-communist	−0.304*	−0.266	−0.063	0.046	−0.055	−0.119	−0.153
	(0.162)	(0.170)	(0.201)	(0.205)	(0.169)	(0.151)	(0.158)
Tertiary Education	0.719***	0.569***	0.708***	0.826***	0.796***	0.754***	0.655***
	(0.084)	(0.087)	(0.066)	(0.099)	(0.108)	(0.086)	(0.092)
Post-communist × Tertiary Education	−0.058	−0.006	0.057	−0.069	−0.061	−0.057	0.039
	(0.091)	(0.099)	(0.086)	(0.118)	(0.101)	(0.100)	(0.093)

Source: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: Standard errors in parentheses are clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
In all the regressions we additionally control for log household income per capita, employment status, education level, log GDP per capita, urban/rural status, gender, age, age squared, the number of children, marital status, religion, and the country's involvement in a military conflict or war. The coefficients for these variables are significant and similar to those reported in Table 3. We consider all countries that have GDP per capita no higher than US$ 35,000 (PPP, 2016) as comparators.

becoming less satisfied with life, regardless of age group.

The specifications used in Table 4 and Fig. 5 are slightly different. Table 4 presents the results of separate cross-sectional estimations for 2010 and 2016, while Fig. 5 is based on a pooled regression for both years. Nonetheless, Table 4 confirms the findings of Fig. 5, suggesting that the transition happiness gap had closed for most age groups.

3.2.2. Transition happiness gap by education categories

We now consider the role of education in closing the transition happiness gap. As in the case of age, our main question is whether or not the change in the happiness gap was uniform across education levels. To address this question we begin with considering model (3) that additionally includes an interaction term of $\mathbb{1}\{post-communist\ country\}_c \cdot \mathbb{1}\{tertiary\ education\}_{ic}$. Table 5 presents the results for the years 2010–2016.

If the transition happiness gap were systematically larger or smaller for the better educated, the coefficient for the interaction term would have been significant. However, as shown in Table 5, this is not the case: the coefficient is not statistically significant for all the years. Thus, on average the return to education in post-communist and comparator countries was the same during all the years, and the convergence in life satisfaction was uniform across education levels.

Nonetheless, the average effect hides the heterogeneity in terms of the impact of education across age groups. In order to analyze this heterogeneity, we compare the residual of life satisfaction across birth year cohorts for individuals with and without tertiary education. As in Fig. 5, we exclude the dummy for residence in a post-communist country and all the age variables and estimate model (1), simultaneously for 2010 and 2016; then nonparametrically assess the size of the residual for transition and non-transition countries for each birth year. In order to understand the role of education, we separately consider the average residuals for two subsets: individuals with and without tertiary education. Our estimates are displayed in Fig. 6. We should emphasize that to make Figs. 5 and 6 comparable, we consider the residuals after controlling for the same set of correlates of life satisfaction – including tertiary education itself. Therefore the residuals do not include the average direct impact of education on life satisfaction (as estimated for the whole sample). Because of the small number of individuals with tertiary education who were born before 1940, we exclude earlier birth years from the analysis.

The results are as follows. First and foremost, in all graphs, the residuals for individuals with and without tertiary education are

very similar – suggesting that the effect of education on happiness is virtually uniform for all cohorts in transition and non-transition countries. The exceptions are the very young and very old cohorts. However, as the last pair of graphs shows, these cohorts are not very representative: there are very few college-educated individuals among the very young, and there are disproportionally many individuals with tertiary education among the very old. The latter observation may be driven by a positive correlation between education and life expectancy.

In 2010 the curves for the residual of life satisfaction almost perfectly coincided for individuals born from 1955 to 1980, regardless of whether they lived in transition or non-transition countries. This suggests that across these birth year cohorts the effect of education on life satisfaction is homogeneous and accurately estimated by model (1) for both types of countries. In turn, the return to education was considerably lower for the young (born after 1980) in post-communist countries, while the opposite was true in comparator countries. Similarly, educated individuals, born before 1955, experienced lower levels of life satisfaction when living in transition countries and higher levels of life satisfaction when living in non-transition countries, although in the latter case the gap was less prominent.

By 2016 the following changes had taken place. For post-communist countries, the effect of a university degree had become more homogeneous across birth year cohorts, with the gap for the young and the old becoming considerably narrower. Only the young still experienced a slightly lower return to education. In comparator countries, the effect of a university degree also generally became more homogeneous for individuals born after 1960. In particular, the return to education decreased for the young, while it remained the same for the middle-aged. However, the effect of a university degree substantially increased for the generations born before 1960.

We further compare the residual curves across time. In post-communist countries, the curve for educated individuals had shifted upwards, denoting an increase in life satisfaction, while the curve for the uneducated remained the same for the middle-aged and shifted downwards for the young and the old. At the same time, in comparator countries both curves shifted downwards for all age groups except for the older cohorts with tertiary education. In terms of the transition happiness gap, these results imply that – apart from the general convergence by birth year cohorts discussed in the previous section – by 2016 the gap had narrowed substantially for young individuals with tertiary education. This convergence was driven both by an increase in the return to education in post-communist countries and a respective decrease for comparator countries. Furthermore, the results imply that the transition happiness gap generally narrowed for the educated individuals, except those born before 1960. In turn, uneducated individuals experienced little convergence in life satisfaction (with the possible exception of the middle-aged).

Our conclusions are confirmed when we reproduce the same regressions as in Table 4 separately for individuals with and without tertiary education. Table 6 presents the results.

Most notably, although the transition happiness gap had already closed by 2010 for the younger generations when all education levels were considered, it remained present for individuals with tertiary education. Moreover, the gap was very large in magnitude, corresponding to nearly 1.3 steps on the 10-step happiness ladder for individuals born after 1990. By 2016 this gap had closed, and the educated young in post-communist countries are no longer less satisfied with life than their peers in comparator countries.

In other respects, Table 6 also confirms the findings of Fig. 6. In particular, although all educated individuals born after 1954 experienced convergence in life satisfaction, the transition happiness gap persisted for the older cohorts with higher education. In turn, the gap only slightly narrowed for the uneducated, although it should be noted that in 2010 it had already been considerably smaller than for individuals with tertiary education.

Overall, we conclude that the convergence in life satisfaction was primarily driven by educated individuals, especially the young. As discussed in Guriev and Zhuravskaya (2009), this may be explained by the fact that the younger cohorts received their education after the transition from plan to market; this education was probably more suitable for the needs of the market economy.

3.2.3. Transition happiness gap by gender

In this subsection, we explore the evolution of the transition happiness gap by gender. Following an approach, similar to the one for education, we begin with excluding the dummy for residence in a post-communist country and replacing it with two interaction terms: $\mathbb{1}\{post-communist\ \ country\}_c \cdot \mathbb{1}\{female\}_{ic}$ and $\mathbb{1}\{post-communist\ \ country\}_c \cdot \mathbb{1}\{male\}_{ic}$. Thus, we are able to separately estimate the transition happiness gap for the male and female population. The results are presented in Table 7.

We find that the female population of post-communist countries used to be significantly less satisfied with life than their counterparts in comparator countries. In particular, by 2010 the transition happiness gap had already closed for the male part of the population. In turn, for women the gap persisted, allowing us to conclude that the overall transition happiness gap was primarily determined by females.

By 2016 both men and women had experienced further convergence in life satisfaction. In particular, the transition happiness gap for women had closed, thus, driving its closure for the entire population as well.

Notably, the sum of coefficients for being female and being female in a transition country is always almost perfectly equal to the coefficient for being male in a transition country. Thus, while in comparator countries women were on average happier than men, in post-communist countries the respective levels of life satisfaction were practically identical. This relationship is present for all the years in our sample with the possible exception of 2014 and 2015, suggesting that the convergence in life satisfaction was uniform across gender.

We next estimate the size of the transition happiness gap by birth year cohorts separately for the male and female population. The results are presented in Table 8.

Confirming the results of Table 7, in 2010 the transition happiness gap was large and significant for all female cohorts except the very young, while for men it was present only for the old and was considerably smaller. In particular, only men born before 1961 experienced significantly lower levels of life satisfaction in post-communist countries than in comparator countries. For women, the

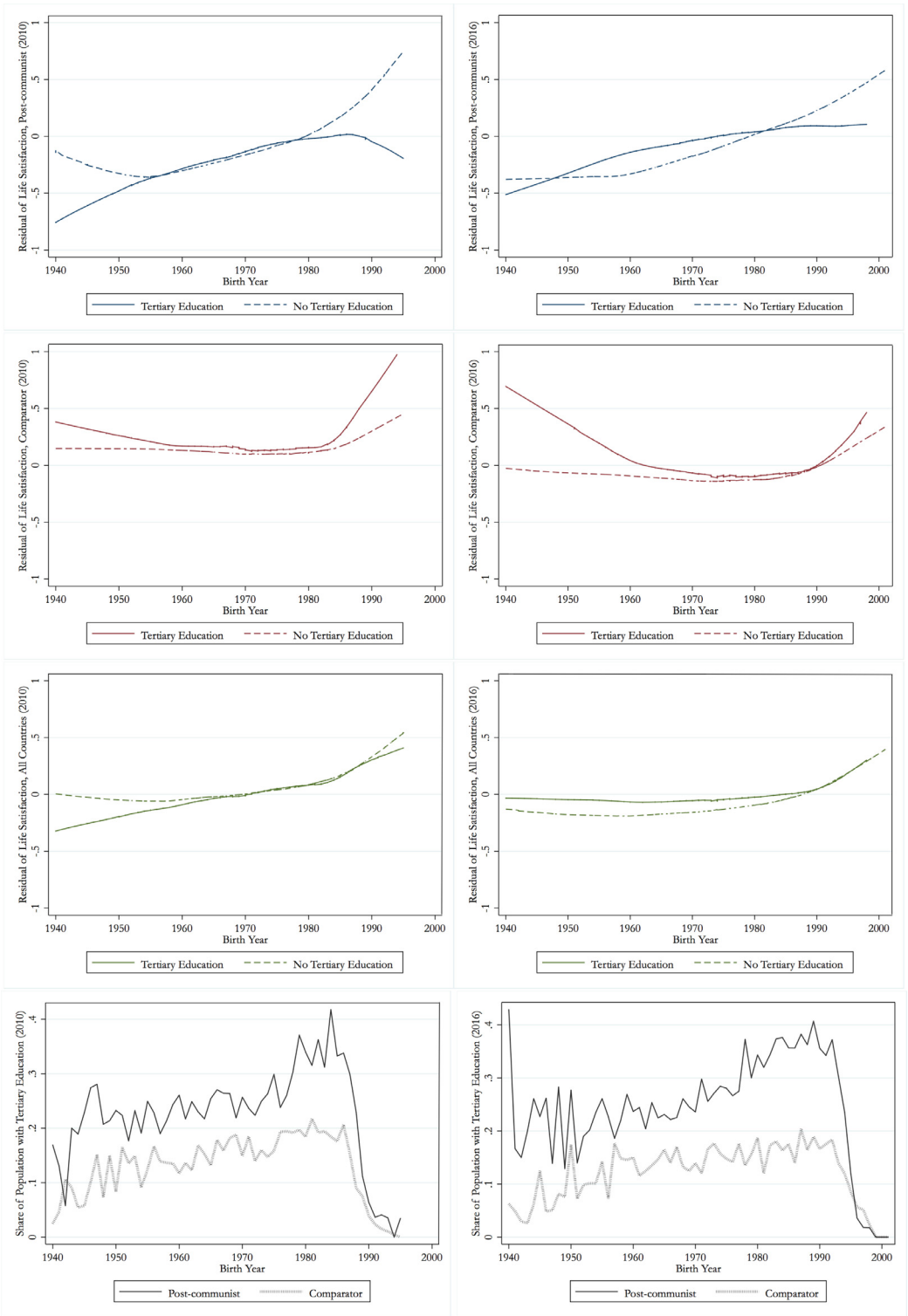

Fig. 6. Residual of life satisfaction by birth year and education level, GWP. *Source*: Gallup World Poll and authors' calculations.

Notes: In the first three pairs of graphs the solid line represents the average value of the residual of life satisfaction for individuals with tertiary education, the dashed line – without tertiary education. In the last pair of graphs the solid line represents the sample share of the population with tertiary education in post-communist countries, the dashed line – in comparator countries. In each pair, the left graph shows the results for 2010 and the right one shows the results for 2016.

Table 6
The transition happiness gap by birth year group and education level, GWP.

	With Tertiary Education									
Year of Birth	> 1996	1991–1996	1985–1990	1979–1984	1973-1978	1967–1972	1961–1966	1955–1960	1949–1954	< 1949
THG (2010)	–	−1.314***	−0.270*	−0.282*	−0.340**	−0.221	−0.377**	−0.644***	−0.502**	−1.120***
		(0.363)	(0.151)	(0.162)	(0.154)	(0.181)	(0.168)	(0.178)	(0.196)	(0.245)
THG (2016)	−0.659	−0.222	−0.124	−0.027	−0.083	−0.015	−0.169	−0.321	−0.658**	−0.862**
	(0.664)	(0.233)	(0.170)	(0.189)	(0.199)	(0.181)	(0.206)	(0.232)	(0.270)	(0.378)
	Without Tertiary Education									
Year of Birth	> 1996	1991–1996	1985–1990	1979–1984	1973-1978	1967–1972	1961–1966	1955–1960	1949–1954	< 1949
THG (2010)	–	0.381**	−0.020	−0.164	−0.171	−0.249	−0.262	−0.361*	−0.531***	−0.352*
		(0.187)	(0.169)	(0.172)	(0.175)	(0.173)	(0.187)	(0.187)	(0.195)	(0.206)
THG (2016)	0.314	0.064	0.035	−0.034	−0.036	−0.105	−0.237	−0.216	−0.490**	−0.292
	(0.204)	(0.159)	(0.156)	(0.174)	(0.153)	(0.165)	(0.192)	(0.202)	(0.199)	(0.297)

Source: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: Standard errors in parentheses are clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
In all the regressions we additionally control for log household income per capita, employment status, education level, log GDP per capita, urban/rural status, gender, the number of children, marital status, religion, and the country's involvement in a military conflict or war. The coefficients for these variables are significant and similar to those reported in Table 3. We consider all countries that have GDP per capita no higher than US$ 35,000 (PPP, 2016) as comparators.

Table 7
Gender and the transition happiness gap, GWP.

	Life Satisfaction						
	(7.1)	(7.2)	(7.3)	(7.4)	(7.5)	(7.6)	(7.7)
Year	2010	2011	2012	2013	2014	2015	2016
Post-communist × Male	−0.244	−0.125	0.041	0.135	−0.033	−0.048	−0.075
	(0.162)	(0.175)	(0.201)	(0.205)	(0.164)	(0.153)	(0.152)
Post-communist × Female	−0.375**	−0.426**	−0.176	−0.056	−0.079	−0.197	−0.242
	(0.168)	(0.171)	(0.204)	(0.209)	(0.181)	(0.160)	(0.170)
Female	0.152***	0.307***	0.231***	0.239***	0.195***	0.254***	0.197***
	(0.049)	(0.066)	(0.047)	(0.057)	(0.052)	(0.047)	(0.058)

Source: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: Standard errors in parentheses are clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
In all the regressions we additionally control for log household income per capita, employment status, education level, log GDP per capita, urban/rural status, gender, age, age squared, the number of children, marital status, religion, and the country's involvement in a military conflict or war. The coefficients for these variables are significant and similar to those reported in Table 3. We consider all countries that have GDP per capita no higher than US$ 35,000 (PPP, 2016) as comparators.

gap was present for all cohorts born before 1985.

By 2016 practically all individuals experienced some convergence in life satisfaction, regardless of gender. Moreover, this convergence was virtually uniform for the young and middle-aged individuals of both sexes. However, the transition happiness gap had decreased substantially for the old male population (born before 1955), whereas for old women it remained the same as in 2010.

We also note that while in 2010–2016 females living in comparator countries were significantly happier than men, in post-communist countries life satisfaction remained approximately the same across the genders.

Summing up, we find that in 2010 the overall transition happiness gap mainly persisted due to its presence for women; for men, the gap had already closed. By 2016 nearly all parts of the society had experienced convergence in life satisfaction, regardless of age and gender, and the transition happiness gap became no longer statistically significant for women. The only part of the population that did not experience convergence in life satisfaction were women born before 1955. For these women, the transition happiness gap remained very large even in 2016. Given that in transition countries women significantly outlive men (and the gap between female and male life expectancy is larger than in comparator countries), this fact has major political implications: older women dissatisfied with their lives are more likely to reject reforms that may bring prosperity in the long run. Policymakers should investigate the sources of low life satisfaction of older women and carry out the policies that can correct these remaining disproportionately large happiness gaps.

3.2.4. Transition happiness gap by income level

We further examine whether the closure of the transition happiness gap was homogeneous across income levels. In order to

Table 8
The transition happiness gap by birth year group and gender, GWP.

	Female									
Year of Birth	> 1996	1991–1996	1985–1990	1979–1984	1973-1978	1967–1972	1961–1966	1955–1960	1949–1954	< 1949
THG (2010)	–	0.352	−0.221	−0.331*	−0.348**	−0.409**	−0.570***	−0.742***	−0.777***	−0.829***
		(0.218)	(0.165)	(0.181)	(0.173)	(0.166)	(0.173)	(0.187)	(0.189)	(0.215)
THG (2016)	0.245	−0.083	−0.175	−0.221	−0.214	−0.229	−0.414**	−0.526**	−0.745***	−0.861**
	(0.243)	(0.165)	(0.153)	(0.189)	(0.170)	(0.183)	(0.196)	(0.216)	(0.257)	(0.330)
	Male									
Year of Birth	> 1996	1991–1996	1985–1990	1979–1984	1973-1978	1967–1972	1961–1966	1955–1960	1949–1954	< 1949
THG (2010)	–	0.339*	−0.056	−0.182	−0.250	−0.295	−0.249	−0.371**	−0.558***	−0.415**
		(0.201)	(0.167)	(0.156)	(0.165)	(0.178)	(0.181)	(0.177)	(0.204)	(0.207)
THG (2016)	0.389	0.003	0.060	0.083	0.013	−0.069	−0.177	−0.109	−0.450**	−0.100
	(0.242)	(0.176)	(0.163)	(0.161)	(0.155)	(0.151)	(0.179)	(0.189)	(0.187)	(0.282)

Source: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: Standard errors in parentheses are clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
In all the regressions we additionally control for log household income per capita, employment status, education level, log GDP per capita, urban/rural status, gender, the number of children, marital status, religion, and the country's involvement in a military conflict or war. The coefficients for these variables are significant and similar to those reported in Table 3. We consider all countries that have GDP per capita no higher than US$ 35,000 (PPP, 2016) as comparators.

understand whether the happiness convergence has been driven by richer or poorer households, we again compare the residuals of life satisfaction across income levels for post-communist and comparator countries. In particular, after excluding log household income per capita and the dummy for residence in a transition country, we estimate model (1) simultaneously for 2010 and 2016 and then plot the non-parametric relationship between the residual and log household income per capita for post-communist and comparator countries. Our findings are presented in Fig. 7.[16] Similarly to Fig. 5 above, the vertical distance between the curves in Fig. 7 represents the transition happiness gap for a given income level.

In 2010 the transition happiness gap for the poorest individuals (income per capita $\leq$ \$1,100 or logarithm of income per capita $\leq$ 7) was quite small, corresponding to 0.2–0.25 points on the ten-step happiness ladder. For the middle part of the income distribution in the transition region (household income per capita between \$1,100 and \$8,100 or log household income per capita between 7 and 9), constituting almost 68% of the population in post-communist countries, the gap was much wider, about half a step on the happiness ladder. However, for the richest individuals the gap was again narrow, fully closing for those with income per capita of \$20,000 and higher (logarithm of income per capita $\geq$ 10).

By 2016 post-communist countries had experienced an increase in the life satisfaction of the middle-income individuals, while for the poor and the rich the average residual did not change. In turn, comparator countries experienced a decline in life satisfaction for all income levels except for the very rich, resulting in the closure of the transition happiness gap for all income levels. In particular, middle-income individuals in post-communist countries almost fully converged in terms of life satisfaction with their non-transition peers.

It is also important to emphasize that by 2016 the post-communist countries had arrived at a linear relationship between the logarithm of per capita income and life satisfaction, characteristic for non-transition countries and the world as a whole (Stevenson and Wolfers, 2008). While as recently as in 2010 this relationship exhibited "increasing marginal happiness returns to income" in transition countries, now the relationship between the logarithm of income and life satisfaction is linear, and its slope is the same as in the rest of the world.

To confirm the findings shown in Fig. 7, we carry out an econometric estimation of the size of the transition happiness gap for various income levels. Similarly to the case of age and education, we consider model (5) that excludes the dummy for residence in a post-communist country but instead includes the interaction terms of $\mathbb{1}\{post-communist\ \ country\}_c \cdot \mathbb{1}\{income \in \mathcal{I}\}_{ic}$ for various income groups $\mathcal{I}$. Table 9 presents the results.

As suggested by Fig. 7, in 2010 the transition happiness gap was largest for individuals with log household income per capita between 7.5 and 9. For all other income levels, the gap had already closed. In turn, by 2016 the levels of life satisfaction in post-communist and comparator countries had further converged. Most notably, the transition happiness gap had disappeared for middle-income individuals.

Overall, we find that the transition happiness gap had previously been primarily determined by middle-income individuals, constituting a significant part of the population. By 2016 the gap had closed for these income levels, contributing to the general

[16] Because of the small number of individuals in post-communist countries with log household income per capita below 5 or above 10.5 (income per capita below \$148 or above \$36,300), we exclude these observations from the analysis. Together these observations constitute less than 1% of the sample population of post-communist countries.

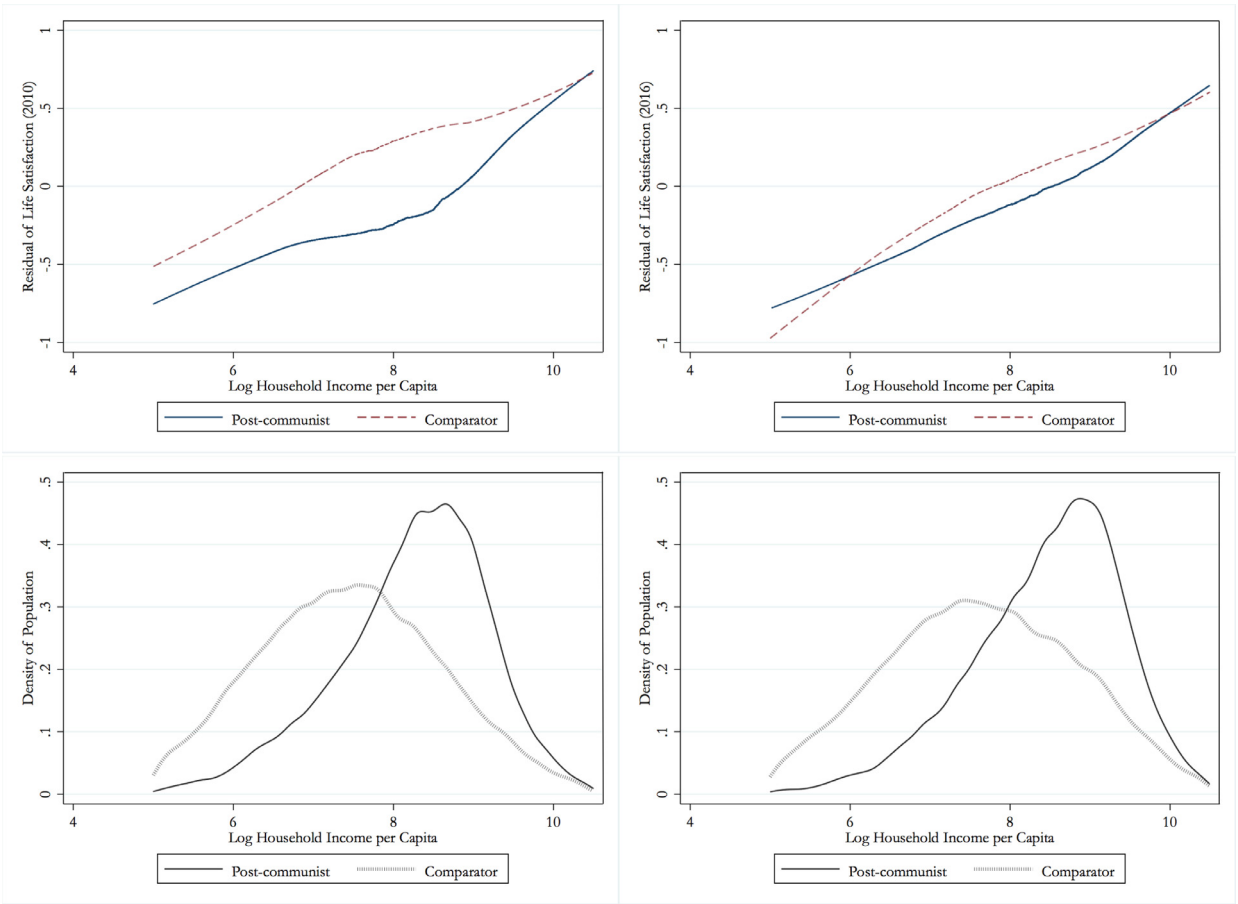

Fig. 7. The transition happiness gap by income level, GWP. *Source*: Gallup World Poll and authors' calculations.

Notes: We consider the panel of countries with data for 2010–2016 (23 post-communist and 40 comparator countries). The solid line represents the average value of the residual of life satisfaction for post-communist countries, the dashed line – for comparator countries. The income specific transition happiness gap is the difference between the two lines.

convergence in life satisfaction in post-communist and comparator countries.

3.3. Robustness checks

In this section, we present several robustness checks: breaking down the results by country groups, re-estimating LiTS results with a five-point (rather than binary) scale for the degree of life satisfaction, adding rich countries as comparators, and estimating a two-

Table 9
The transition happiness gap by income level, GWP.

	Log Household Income per Capita									
	< 6	6–6.5	6.5–7	7–7.5	7.5–8	8–8.5	8.5–9	9–9.5	9.5–10	> 10
THG (2010)	−0.156	−0.204	−0.188	−0.279	−0.348**	−0.476***	−0.374*	−0.277	−0.199	−0.267
	(0.161)	(0.210)	(0.195)	(0.185)	(0.162)	(0.172)	(0.191)	(0.191)	(0.228)	(0.251)
THG (2016)	0.337	−0.131	−0.255	−0.064	−0.151	−0.161	−0.183	−0.169	−0.156	−0.104
	(0.437)	(0.295)	(0.254)	(0.220)	(0.208)	(0.183)	(0.165)	(0.154)	(0.164)	(0.196)

Source: Gallup World Poll and authors' calculations.

Notes: Standard errors in parentheses are clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
In all the regressions we additionally control for log household income per capita, employment status, education level, log GDP per capita, urban/rural status, gender, the number of children, marital status, religion, and the country's involvement in a military conflict or war. The coefficients for these variables are significant and similar to those reported in Table 3. We consider all countries that have GDP per capita no higher than US$ 35,000 (PPP, 2016) as comparators.

stage procedure (first estimating the returns to individual characteristics and then running the country-level regressions for residuals on country-level variables).

3.3.1. Heterogeneity among countries

We have checked whether the closure of the transition happiness gap was uniform across various groups of post-communist countries. In particular, we use EBRD's classification of countries into Central Asia, Central Europe and the Baltics, South-Eastern Europe, and Eastern Europe and the Caucasus (the results are available upon request). The "happiness convergence" turns out to be strikingly uniform across all the groups of countries with the exception of Eastern Europe and the Caucasus. However, the latter result is driven solely by Ukraine: in Eastern Europe and the Caucasus excluding Ukraine, the transition happiness gap has also closed. In Ukraine, however, the happiness gap has actually grown significantly since 2010. As shown in Fig. 3, Ukraine had zero happiness gap in 2010 but a gap of a full one point (on a ten-point scale) in 2016. This substantial decrease in life satisfaction in Ukraine is likely to have been caused by the instability associated with the political turbulence of the last months of Yanukovych's government, the annexation of Crimea, and the war in Eastern Ukraine.

3.3.2. Five-point scale in the Life in Transition Survey

We re-estimate the regressions of Table 1, using a five-point scale for the degree of life satisfaction. The results are presented in Table 10 and are very similar those reported in Table 1 in terms of sign, magnitude, and statistical significance. In all regressions, there is no statistically significant transition happiness gap.

3.3.3. Adding rich countries as comparators

In the Gallup World Poll regressions above we excluded rich comparator countries (i.e. all countries with GDP per capita above $35,000). In this section, we all the available countries as comparators. Columns (11.1)–(11.7) of Table 11 reproduce the results of Table 3, using the panel for this new set of comparators.

When rich comparator countries are included in the regression, in some specifications we find no transition happiness gap in 2012–14, but a marginally significant transition happiness gap in 2015–16. This difference in results is fully explained by the fact that residents of rich countries are considerably more satisfied with life than their peers in poorer countries, even controlling for log household income per capita and GDP per capita. Notably, although GDP per capita was never significant in columns (3.8)–(3.14), it became highly significant in columns (11.1)–(11.7), suggesting that the new set of comparator countries requires additional control variables to explain the differences in life satisfaction. The return to income is also estimated to be considerably higher in columns (11.1)–(11.7) than in Table 3, suggesting that the relationship between income and life satisfaction in rich countries is different from the respective relationship for poorer countries.

Fig. 8 provides further evidence in support of this conclusion. Similarly to Fig. 3, it plots the relationship between average life satisfaction and the level of GDP per capita, now additionally including rich non-transition countries. A separate linear trend is added for countries with GDP per capita above and below $35,000, as well as a non-parametric (lowess) estimate of the respective relationship.

We find a discontinuous increase in life satisfaction after a country reaches the level of GDP per capita of $35,000 (which corresponds to a steep increase in the case of non-parametric estimation). This suggests that the residents of rich countries are considerably happier than predicted by their income; therefore, it is problematic to use them as comparators when estimating the transition happiness gap.

Regression analysis also shows that life satisfaction in rich countries is considerably higher than in other non-transition countries. We estimate the following model. Using all the same variables as in model (1), we additionally include a dummy for residence in a country that had GDP per capita larger than $35,000 in 2010–2016. Thus, the coefficient for the latter represents the difference in life satisfaction between non-transition countries with high and low income levels. To make interpretation easier, we exclude countries that had GDP per capita both above and below the respective cutoff level during the considered time period. The results are presented in columns (11.8)–(11.14) of Table 11.

We find that residents of rich countries are significantly more satisfied with life than their peers in other non-transition countries. Moreover, the respective coefficient is quite large, representing approximately half a step on the ten-step happiness ladder. This is nearly twice as large as the size of the transition happiness gap at its peak in 2010. Therefore, we conclude that the reappearance of a small transition happiness gap, reported in columns (11.1)–(11.7), was primarily driven by the particularly high levels of life satisfaction in rich countries rather than by the low levels of happiness in post-communist countries.

3.3.4. Two-stage estimation

The specification of model (1) assumes that the value of the intercept for all non-transition countries is the same conditional on the logarithm of GDP per capita and involvement in a military conflict. In turn, the size of the transition happiness gap is assumed to be the same in all the post-communist countries. These assumptions are consistent with the existing literature and are partially justified by the fact that the relationship between the average level of life satisfaction and the logarithm of the country's GDP per capita is linear, as shown in Fig. 3. Nevertheless, it is possible that the coefficients for the individual-level and household-level characteristics were affected by the imposed uniformity of country-specific intercepts among post-communist countries and among comparators.

Using data from the Gallup World Poll, we show that our results do not change if we consider a more general setting where the level of the intercept is initially allowed to vary arbitrarily from country to country. In particular, we consider the following two-stage

Table 10
The transition happiness gap, LiTS.

	Life satisfaction				
	(10.1)	(10.2)	(10.3)	(10.4)	(10.5)
Post-communist	−0.154	−0.040	−0.109	0.157	0.043
	(0.258)	(0.246)	(0.212)	(0.163)	(0.149)
Log Household Income per Capita		0.286***		0.297***	
		(0.075)		(0.074)	
Can Afford Holidays and Meat			0.436***		0.448***
			(0.030)		(0.028)
Can Afford Unexpected Expenses			0.360***		0.353***
			(0.027)		(0.025)
Female	0.025*	0.054***	0.052***	0.059***	0.052***
	(0.013)	(0.011)	(0.011)	(0.013)	(0.010)
Age/10	−0.243***	−0.289***	−0.250***	−0.268***	−0.239***
	(0.039)	(0.041)	(0.035)	(0.052)	(0.044)
$Age^2/100$	0.022***	0.027***	0.025***	0.026***	0.025***
	(0.003)	(0.004)	(0.003)	(0.005)	(0.004)
Primary Education	0.326***	0.296***	0.292***	0.226***	0.224***
	(0.081)	(0.076)	(0.075)	(0.074)	(0.072)
Secondary Education	0.544***	0.473***	0.406***	0.394***	0.331***
	(0.087)	(0.080)	(0.077)	(0.084)	(0.078)
Tertiary Education	0.748***	0.609***	0.482***	0.527***	0.407***
	(0.089)	(0.089)	(0.074)	(0.095)	(0.077)
Unemployed	−0.540***	−0.412***	−0.374***	−0.392***	−0.365***
	(0.045)	(0.052)	(0.036)	(0.054)	(0.036)
Number of Children	0.034*	0.099***	0.052***	0.108***	0.054***
	(0.018)	(0.022)	(0.016)	(0.023)	(0.017)
Married	0.103***	0.136***	0.050*	0.109**	0.037
	(0.028)	(0.027)	(0.027)	(0.041)	(0.032)
Divorced/Separated	−0.163***	−0.152***	−0.154***	−0.178***	−0.162***
	(0.025)	(0.025)	(0.023)	(0.036)	(0.027)
Widow[er]	−0.111***	−0.113***	−0.093***	−0.152***	−0.112***
	(0.030)	(0.030)	(0.029)	(0.045)	(0.033)
Urban	−0.079**	−0.126***	−0.108***	−0.144***	−0.123***
	(0.029)	(0.036)	(0.024)	(0.040)	(0.029)
Log GDP per Capita	0.073	−0.090	−0.027	−0.103	−0.031
	(0.108)	(0.102)	(0.099)	(0.107)	(0.102)
Observations	44448	35079	44448	38664	48857

Source: LiTS III, World Development Indicators and authors' calculations.

Notes: Standard errors in parentheses are clustered at the country level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10 reproduces the results of Table 1, using a 5-point scale of life satisfaction instead of the binary measure. The income is self-reported in local currency and then converted to US dollars. In all regressions we additionally control for religion; the coefficients at these variables are statistically significant. *Number of children* is the number of children under 18 currently living in the house. Specifications (10.1)-(10.3) include 29 post-communist countries, Germany and Italy. Specifications (10.4)-(10.5) also include Cyprus, Greece, and Turkey.

procedure. First, we run model (1) adding a dummy for each country in our sample. Thus, we estimate the effect of individual-level and household-level characteristics, while allowing for an arbitrary impact of country-level variables such as the transition happiness gap.[17] We then subtract the effect of individual-level and household-level characteristics, creating a measure of life satisfaction that only depends on variables that are determined at a country level. After that we construct the weighted average of residual life satisfaction for each of the countries, using population weights, and consider the second-stage regression of the following form.

$$residual\ \ life\ \ satisfaction_c = \rho \cdot \mathbb{1}\{post{-}communist\ \ country\}_c + \mathcal{X}_c'\Gamma + \varepsilon_c. \tag{6}$$

At this stage, we no longer need to control for individual-level characteristics, so $\mathcal{X}$ contains only country-level variables such as the logarithm of GDP per capita and involvement in a military conflict or war. The difference between ρ in model (6) and β in model (1) comes from the fact that because of the inclusion of country dummies at the first stage, the estimates of the coefficients for individual-level and household-level characteristics may change.

Table 12 presents the estimates of the transition happiness gap, calculated via our two-stage procedure, for the panel of countries with data from 2010 to 2016.[18] In general, all the coefficients (including those at the individual and household-level characteristics) are very similar to those reported in Table 3. The happiness gap itself is estimated to be slightly larger than for model (1) for all the

[17] Note that the country dummies absorb all the country-level characteristics that we previously included in the model (i.e., log GDP per capita, involvement in a military conflict, etc.).

[18] Here we again use only countries with GDP per capita no greater than $35,000 as comparators.

Table 11
The evolution of the transition happiness gap, GWP.

	Life Satisfaction							Life Satisfaction						
	(11.1)	(11.2)	(11.3)	(11.4)	(11.5)	(11.6)	(11.7)	(11.8)	(11.9)	(11.10)	(11.11)	(11.12)	(11.13)	(11.14)
Year	2010	2011	2012	2013	2014	2015	2016	2010	2011	2012	2013	2014	2015	2016
Post-communist	−0.428***	−0.388***	−0.164	−0.102	−0.172	−0.202*	−0.237*	−0.319**	−0.254	−0.051	0.036	−0.049	−0.120	−0.132
	(0.118)	(0.140)	(0.144)	(0.154)	(0.127)	(0.112)	(0.124)	(0.155)	(0.167)	(0.193)	(0.197)	(0.156)	(0.140)	(0.155)
GDP per capita ≥ $35,000								0.605**	0.854***	0.687**	0.638**	0.523**	0.404*	0.448**
								(0.260)	(0.232)	(0.275)	(0.290)	(0.238)	(0.213)	(0.218)
Log Household Income per Capita	0.445***	0.511***	0.409***	0.435***	0.454***	0.485***	0.480***	0.411***	0.464***	0.398***	0.398***	0.414***	0.456***	0.449***
	(0.038)	(0.046)	(0.045)	(0.047)	(0.034)	(0.040)	(0.039)	(0.037)	(0.042)	(0.048)	(0.045)	(0.035)	(0.039)	(0.038)
Unemployed	−0.557***	−0.574***	−0.560***	−0.611***	−0.542***	−0.574***	−0.587***	−0.556***	−0.559***	−0.519***	−0.612***	−0.517***	−0.589***	−0.582***
	(0.070)	(0.076)	(0.058)	(0.080)	(0.060)	(0.061)	(0.068)	(0.074)	(0.080)	(0.068)	(0.082)	(0.063)	(0.064)	(0.072)
Secondary Education	0.411***	0.280***	0.444***	0.463***	0.393***	0.391***	0.328***	0.420***	0.287***	0.432***	0.462***	0.407***	0.393***	0.321***
	(0.062)	(0.061)	(0.046)	(0.064)	(0.060)	(0.061)	(0.059)	(0.061)	(0.059)	(0.042)	(0.062)	(0.061)	(0.064)	(0.061)
Tertiary Education	0.684***	0.564***	0.771***	0.788***	0.736***	0.715***	0.661***	0.675***	0.544***	0.724***	0.759***	0.739***	0.725***	0.650***
	(0.067)	(0.077)	(0.057)	(0.083)	(0.073)	(0.069)	(0.067)	(0.067)	(0.077)	(0.055)	(0.083)	(0.075)	(0.071)	(0.069)
Log GDP per Capita	0.225***	0.116*	0.286***	0.268***	0.234***	0.184***	0.220***	0.119	−0.024	0.132	0.159	0.113	0.108	0.139
	(0.062)	(0.065)	(0.064)	(0.072)	(0.055)	(0.057)	(0.067)	(0.095)	(0.086)	(0.092)	(0.104)	(0.091)	(0.083)	(0.093)
Female	0.142***	0.210***	0.191***	0.182***	0.184***	0.202***	0.136***	0.117***	0.196***	0.179***	0.185***	0.180***	0.202***	0.136***
	(0.031)	(0.041)	(0.029)	(0.034)	(0.030)	(0.036)	(0.034)	(0.030)	(0.042)	(0.034)	(0.036)	(0.033)	(0.038)	(0.037)
Age/10	−0.489***	−0.660***	−0.601***	−0.493***	−0.653***	−0.619***	−0.589***	−0.446***	−0.579***	−0.485***	−0.447***	−0.579***	−0.601***	−0.585***
	(0.076)	(0.073)	(0.092)	(0.078)	(0.078)	(0.074)	(0.074)	(0.075)	(0.078)	(0.084)	(0.078)	(0.078)	(0.074)	(0.081)
$Age^2/100$	0.046***	0.065***	0.057***	0.044***	0.062***	0.059***	0.055***	0.042***	0.056***	0.044***	0.040***	0.055***	0.057***	0.055***
	(0.008)	(0.008)	(0.010)	(0.009)	(0.008)	(0.008)	(0.008)	(0.007)	(0.008)	(0.009)	(0.008)	(0.008)	(0.008)	(0.009)
Small Town	−0.003	0.065	−0.052	0.060	−0.112	0.010	−0.025	0.031	0.138*	−0.025	0.110	−0.038	0.049	−0.005
	(0.083)	(0.079)	(0.067)	(0.101)	(0.075)	(0.060)	(0.063)	(0.083)	(0.080)	(0.080)	(0.104)	(0.082)	(0.059)	(0.063)
Suburb of Large City	−0.007	−0.152	−0.078	−0.031	−0.197**	−0.138	−0.045	0.075	−0.166	0.027	0.037	−0.100	−0.101	0.027
	(0.128)	(0.118)	(0.095)	(0.131)	(0.099)	(0.087)	(0.083)	(0.127)	(0.118)	(0.116)	(0.145)	(0.111)	(0.092)	(0.091)
Large City	0.115	0.139	0.032	0.046	−0.071	0.050	0.111	0.192***	0.238***	0.142**	0.129	0.032	0.118	0.176**
	(0.082)	(0.085)	(0.073)	(0.098)	(0.072)	(0.070)	(0.075)	(0.071)	(0.082)	(0.066)	(0.099)	(0.077)	(0.072)	(0.076)
Countries	81	81	81	81	81	81	81	72	72	72	72	72	72	72
Post-Communist Countries	23	23	23	23	23	23	23	23	23	23	23	23	23	23
Rich Countries	14	15	15	16	16	17	18	9	9	9	9	9	9	9
Panel of Countries	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	52099	54344	76567	45371	60323	47465	46779	47627	46958	58281	41420	49689	42370	41604

Source: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: Standard errors in parentheses are clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
In all the regressions we additionally control for the number of children, marital status, religion, and the country's involvement in a military conflict or war. All these specifications consider all available comparator countries.

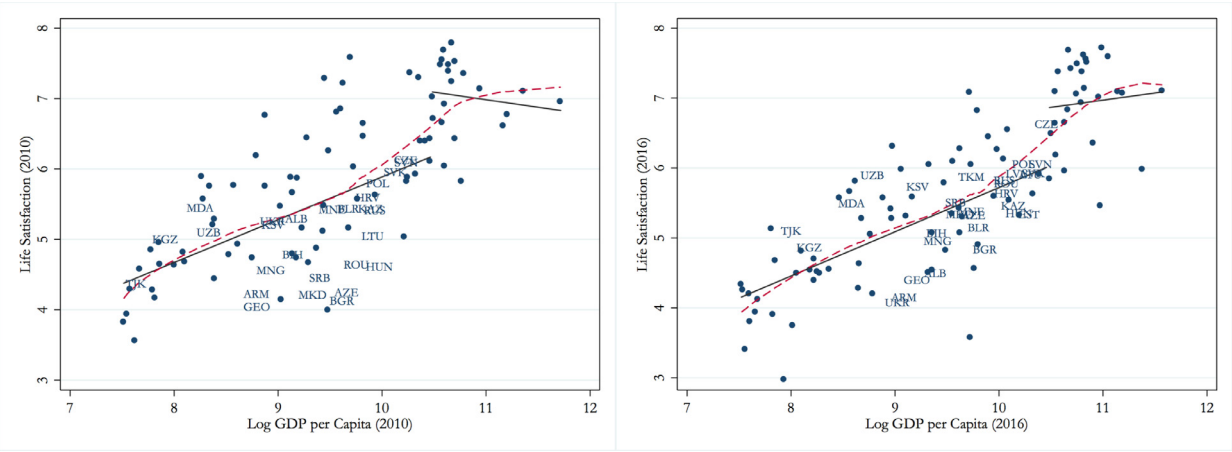

Fig. 8. Life satisfaction and GDP per capita in transition and comparator countries, GWP. *Source*: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: The vertical axis shows the average response the residents of a country give to the question "*Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?*". The horizontal axis shows the GDP per capita in PPP terms (constant 2016 international dollars) in logarithmic scale. Post-communist countries are labeled, dots represent comparator countries. The solid lines represent the linear relationships for countries with GDP per capita above and below $35,000; the dashed line represents the nonparametric, locally weighted regressions (lowess). Each part of the figure considers a cross-section of countries with income levels similar to post-communist countries or higher.

years, but it still stops being significant in 2012 which is consistent with our previous findings. Overall, the two-stage model yields results that are very similar to those of model (1).

4. Concluding remarks

For more than 20 years after the transition from plan to market, the residents of former communist countries consistently reported lower life satisfaction than the residents of other countries with similar levels of income – a phenomenon that became known as the transition happiness gap. However, using newly available data from the Life in Transition Survey and the Gallup World Poll, we find that the transition happiness gap has finally closed. The closing is estimated to have taken place in 2012–2013.

Our analysis suggests that the convergence in life satisfaction was primarily determined by the younger and middle-age cohorts, especially those who were better educated and had middle levels of income. As of 2016, individuals that were younger than 45 no longer had lower life satisfaction when living in post-communist countries rather than other countries with similar levels of income. This finding does not depend on the respondent's gender, income or highest level of completed education. In turn, the older generations, living in post-communist countries, are still significantly less satisfied with life than their peers in comparator countries, although for most individuals the difference has become substantially smaller as well.

Nevertheless, there is considerable heterogeneity in the size of the remaining transition happiness gap for the older cohorts, depending on gender and education. In particular, women born before 1955 did not experience any convergence in life satisfaction in 2010–2016, while for men of a similar age the gap did become slightly smaller. We find no such pattern for the younger and middle-aged cohorts, although we do find that in transition countries women and men have had very similar levels of life satisfaction, while in comparator countries women have consistently been happier than men, resulting in a wider transition happiness gap for the female population. However, for individuals born after 1954, the convergence in life satisfaction was homogenous across gender.

The happiness gap also remains quite large for the older cohorts with tertiary education, while for individuals without a university degree it is substantially smaller. This finding is determined by an increase in the return to education for the old in comparator countries. Conversely, individuals with tertiary education born after 1990 experienced convergence in life satisfaction. These individuals received their education after the transition, so this result is consistent with a "human capital depreciation" argument that conjectures that recent graduates receive skills that are more suitable for the needs of the market economy.

Taken together these results imply that transition happiness gap has closed on average but not for all parts of the society. Policy makers in transition countries need to pay special attention to the well-being of the older cohorts, especially of women. The data we use in this paper is not sufficiently granular to explore the sources of their lower life satisfaction (which are also likely to be country-specific) but the fact that there remains a very large and persistent transition happiness gap among women born before 1967 – and especially those born before 1955 – points to a major social (and therefore political) challenge.

Finally, we find that the relationship between the logarithm of household per capita income and life satisfaction in post-communist countries has become linear – with the same slope as in non-transition countries. This finding may be interpreted as yet another piece of evidence that the "happiness transition" has finally been completed.

Table 12
The two-stage estimation of the transition happiness gap, GWP.

Year	(12.1) 2010	(12.2) 2011	(12.3) 2012	(12.4) 2013	(12.5) 2014	(12.6) 2015	(12.7) 2016
	Second Stage: Residual of Life Satisfaction						
Post-communist	−0.433**	−0.451**	−0.204	−0.111	−0.175	−0.232	−0.279
	(0.186)	(0.194)	(0.195)	(0.220)	(0.181)	(0.170)	(0.176)
Log GDP per Capita	0.222**	0.085	0.178**	0.234**	0.185**	0.216**	0.273***
	(0.087)	(0.091)	(0.085)	(0.100)	(0.091)	(0.086)	(0.094)
	First Stage: Life Satisfaction						
Log Household Income per Capita	0.472***	0.469***	0.440***	0.439***	0.474***	0.474***	0.393***
	(0.036)	(0.029)	(0.045)	(0.036)	(0.030)	(0.032)	(0.027)
Unemployed	−0.448***	−0.428***	−0.395***	−0.433***	−0.413***	−0.485***	−0.510***
	(0.060)	(0.060)	(0.064)	(0.060)	(0.059)	(0.058)	(0.062)
Secondary Education	0.407***	0.315***	0.409***	0.418***	0.348***	0.359***	0.354***
	(0.037)	(0.036)	(0.027)	(0.045)	(0.046)	(0.051)	(0.038)
Tertiary Education	0.736***	0.704***	0.797***	0.864***	0.792***	0.810***	0.823***
	(0.047)	(0.049)	(0.053)	(0.065)	(0.062)	(0.065)	(0.053)
Female	0.086***	0.134***	0.112***	0.116***	0.145***	0.172***	0.121***
	(0.025)	(0.035)	(0.029)	(0.032)	(0.032)	(0.034)	(0.033)
Age/10	−0.365***	−0.452***	−0.372***	−0.374***	−0.568***	−0.562***	−0.543***
	(0.076)	(0.073)	(0.079)	(0.073)	(0.081)	(0.086)	(0.089)
$Age^2/100$	0.031***	0.042***	0.031***	0.031***	0.049***	0.050***	0.047***
	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
Small Town	0.091	0.046	−0.022	0.107*	0.011	0.103**	0.019
	(0.077)	(0.051)	(0.072)	(0.055)	(0.056)	(0.046)	(0.054)
Suburb of Large City	0.153**	−0.015	0.239**	0.099	−0.019	0.081	0.065
	(0.076)	(0.093)	(0.096)	(0.093)	(0.111)	(0.074)	(0.074)
Large City	0.152***	0.110	0.121**	0.131**	0.046	0.092*	0.103*
	(0.052)	(0.067)	(0.050)	(0.053)	(0.054)	(0.052)	(0.053)
Countries	63	63	63	63	63	63	63
Post-Communist Countries	23	23	23	23	23	23	23

Source: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: Standard errors in parentheses are clustered at the country level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
In all the regressions we additionally control for religion, the number of children, marital status, and the country's involvement in a military conflict or war. We consider all countries that have GDP per capita no higher than US$ 35,000 (PPP, 2016) as comparators.

Appendix

Appendix A. GWP Countries

	Post-communist	Comparator, GDP per capita ≤ $35, 000	Comparator, all other
2010	Albania Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Ukraine, Uzbekistan.	Afghanistan, Algeria, Argentina, Bangladesh, Bolivia, Botswana, Brazil, Burkina Faso, Cambodia, Cameroon, Central African Republic, Chad, Chile, Colombia, Comoros, Costa Rica, Cyprus, Dominican Republic, Egypt, El Salvador, Greece, Haiti, Honduras, India, Indonesia, Iraq, Israel, Japan, Jordan, Kenya, Lebanon, Malaysia, Mali, Malta, Mauritania, Mexico, Nepal, New Zealand, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Senegal, South Africa, South Korea, Spain, Sri Lanka, Sudan, Tanzania, Thailand, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Yemen, Zimbabwe.	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Italy, Luxembourg, Netherlands, Saudi Arabia, Singapore, Sweden, United Arab Emirates, United Kingdom, United States.
2011	Albania Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro,	Afghanistan, Algeria, Argentina, Bangladesh, Benin, Bolivia, Botswana, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Chile, Colombia, Comoros, Congo (Kinshasa), Costa Rica, Cyprus, Dominican Republic, Egypt, El Salvador, Ghana, Greece, Guinea, Haiti, Honduras, India, Indonesia, Iran, Iraq, Israel, Jamaica, Jordan, Laos, Lebanon, Lesotho, Madagascar, Malawi, Malaysia, Mali,	Australia, Austria, Bahrain, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, Oman, Qatar, Saudi Arabia, Singapore, Sweden, United

	Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.	Malta, Mauritania, Mauritius, Mexico, Nepal, New Zealand, Nicaragua, Niger, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Rwanda, Senegal, South Africa, South Korea, Spain, Sri Lanka, Sudan, Swaziland, Tanzania, Thailand, Togo, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Vietnam, Yemen, Zambia.	Arab Emirates, United Kingdom, United States.
2012	Albania Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.	Afghanistan, Algeria, Argentina, Bangladesh, Benin, Bolivia, Botswana, Brazil, Burkina Faso, Cambodia, Cameroon, Chad, Chile, Colombia, Comoros, Congo (Kinshasa), Costa Rica, Cyprus, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Greece, Guatemala, Guinea, Haiti, Honduras, India, Indonesia, Iran, Iraq, Jordan, Kenya, Laos, Lebanon, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mexico, Morocco, Myanmar, Nepal, New Zealand, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Rwanda, Senegal, South Africa, South Korea, Spain, Sri Lanka, Sudan, Suriname, Tanzania, Thailand, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.	Austria, Bahrain, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Qatar, Saudi Arabia, Singapore, Sweden, Switzerland, United Arab Emirates, United Kingdom, United States.
2013	Albania Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.	Afghanistan, Angola, Argentina, Bangladesh, Benin, Bhutan, Bolivia, Botswana, Brazil, Burkina Faso, Cameroon, Chad, Chile, Colombia, Congo (Kinshasa), Congo (Brazzaville), Costa Rica, Cyprus, Dominican Republic, Egypt, El Salvador, Ethiopia, Gabon, Ghana, Greece, Guatemala, Guinea, Haiti, Honduras, India, Indonesia, Iran, Iraq, Israel, Ivory Coast, Jamaica, Jordan, Kenya, Lebanon, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Morocco, Myanmar, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Rwanda, Senegal, South Africa, South Korea, Spain, Sri Lanka, Tanzania, Thailand, Tunisia, Turkey, Uruguay, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.	Australia, Austria, Bahrain, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Kuwait, Luxembourg, Netherlands, New Zealand, Saudi Arabia, Sweden, United Arab Emirates, United Kingdom, United States.
2014	Albania Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.	Afghanistan, Algeria, Argentina, Bangladesh, Benin, Bolivia, Botswana, Brazil, Burkina Faso, Cambodia, Cameroon, Chad, Chile, Colombia, Comoros, Congo (Kinshasa), Costa Rica, Cyprus, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Greece, Guatemala, Guinea, Haiti, Honduras, India, Indonesia, Iran, Iraq, Jordan, Kenya, Laos, Lebanon, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mexico, Morocco, Myanmar, Nepal, New Zealand, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Rwanda, Senegal, South Africa, South Korea, Spain, Sri Lanka, Sudan, Suriname, Tanzania, Thailand, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.	Australia, Austria, Bahrain, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Italy, Japan, Kuwait, Luxembourg, Netherlands, New Zealand, Norway, Qatar, Saudi Arabia, Sweden, Switzerland, United Arab Emirates, United Kingdom, United States.
2015	Albania Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.	Afghanistan, Argentina, Bangladesh, Benin, Bolivia, Botswana, Brazil, Burkina Faso, Cambodia, Cameroon, Chad, Chile, Colombia, Congo (Kinshasa), Congo (Brazzaville), CostaRica, Cyprus, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Ghana, Greece, Guatemala, Guinea, Haiti, Honduras, India, Indonesia, Iran, Iraq, Ivory Coast, Jordan, Kenya, Lebanon, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mexico, Morocco, Mozambique, Myanmar, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Rwanda, Senegal, South Africa, South Korea, SouthSudan, Sri Lanka, Tanzania, Togo, Tunisia, Turkey, Uganda, Uruguay, Vietnam, Yemen, Zambia, Zimbabwe.	Australia, Austria, Bahrain, Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Luxembourg, Malta, Netherlands, New Zealand, Norway, Saudi Arabia, Singapore, Sweden, Switzerland, United Arab Emirates, United Kingdom.
	Post-communist	Comparator, GDP per capita ≤ $35, 000	Comparator, all other
2016	Albania Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Moldova, Mongolia, Montenegro, Poland,	Algeria, Argentina, Bangladesh, Benin, Bolivia, Botswana, Brazil, BurkinaFaso, Cambodia, Chad, Chile, Colombia, Congo (Kinshasa), Congo (Brazzaville), Costa Rica, Cyprus, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Ghana, Greece, Guatemala, Guinea, Haiti, Honduras, India, Indonesia, Iraq, Ivory Coast, Jordan, Kenya, Lebanon, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania,	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Malta, Netherlands, New Zealand, Norway, Saudi Arabia, Singapore, South Korea, Spain, Sweden, Switzerland,

	Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.	Mauritius, Mexico, Morocco, Myanmar, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Thailand, Togo, Tunisia, Turkey, Uganda, Uruguay, Vietnam, Yemen, Zambia, Zimbabwe.	United Arab Emirates, United Kingdom, United States.
Panel	Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Lithuania, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Tajikistan, Ukraine, Uzbekistan.	Argentina, Bangladesh, Bolivia, Botswana, Brazil, Burkina Faso, Chad, Chile, Colombia, Costa Rica, Cyprus, Dominican Republic, Egypt, El Salvador, Greece, Haiti, Honduras, India, Indonesia, Iraq, Jordan, Lebanon, Mali, Mauritania, Nepal, Nicaragua, Niger, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Senegal, South Africa, Tanzania, Tunisia, Turkey, Uruguay, Yemen.	Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, Malta, Netherlands, New Zealand, Saudi Arabia, South Korea, Sweden, United Arab Emirates, United Kingdom.

Appendix B. Figures

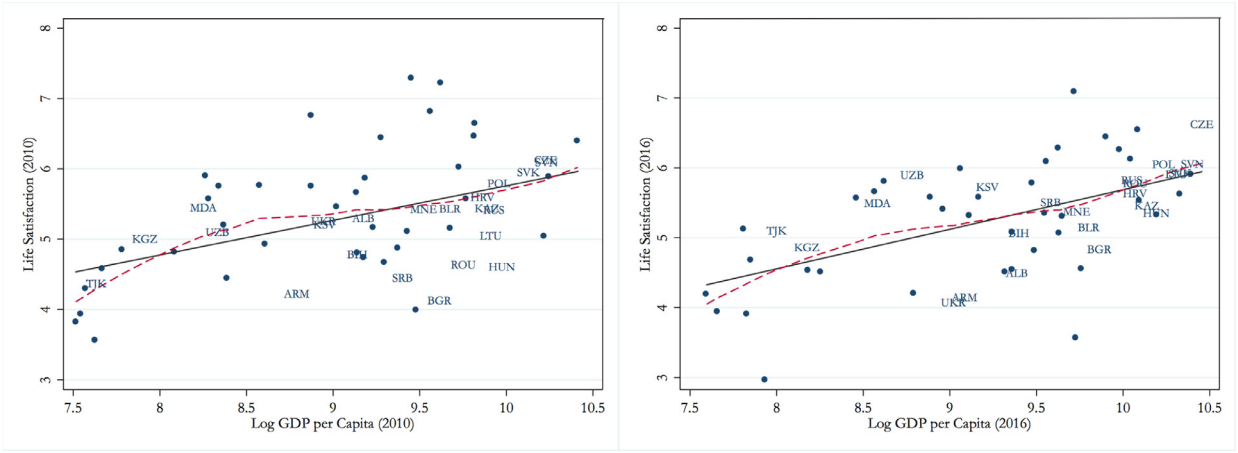

Fig. 9. Life satisfaction and GDP per capita in the GWP panel of transition and comparator countries. *Source*: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: The vertical axis shows the average response the residents of a country give to the question "*Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?*". The horizontal axis shows the GDP per capita in PPP terms (constant 2016 international dollars) in logarithmic scale. Post-communist countries are labeled, dots represent comparator countries. The solid line represents the linear relationship between GDP per capita and life satisfaction; the dashed line represents the nonparametric, locally weighted regressions (lowess). Each part of the figure considers a panel of countries for which the data is available in 2010–2016 with income levels similar to post-communist countries.

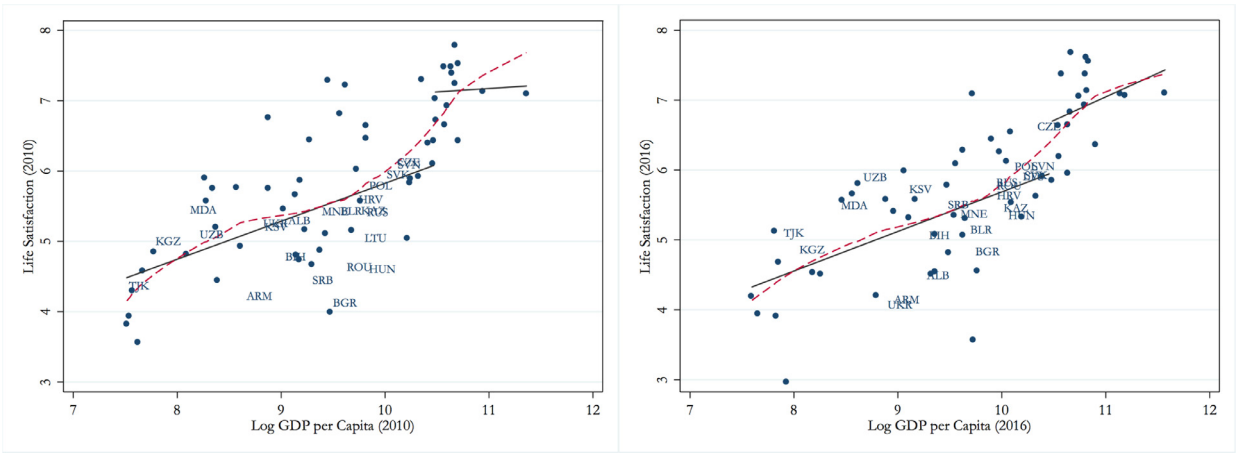

Fig. 10. Life satisfaction and GDP per capita in the GWP panel of transition and comparator countries. *Source*: Gallup World Poll, World Development Indicators and authors' calculations.

Notes: The vertical axis shows the average response the residents of a country give to the question "*Please imagine a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?*". The horizontal axis shows the GDP per capita in PPP terms (constant 2016 international dollars) in logarithmic scale. Post-communist countries are labeled, dots represent comparator countries. The solid lines represent the linear relationships for countries with GDP per capita above and below $35,000; the dashed line represents the nonparametric, locally weighted regressions (lowess). Each part of the figure considers a panel of countries for which the data is available in 2010–2016 with income levels similar to post-communist countries or higher.

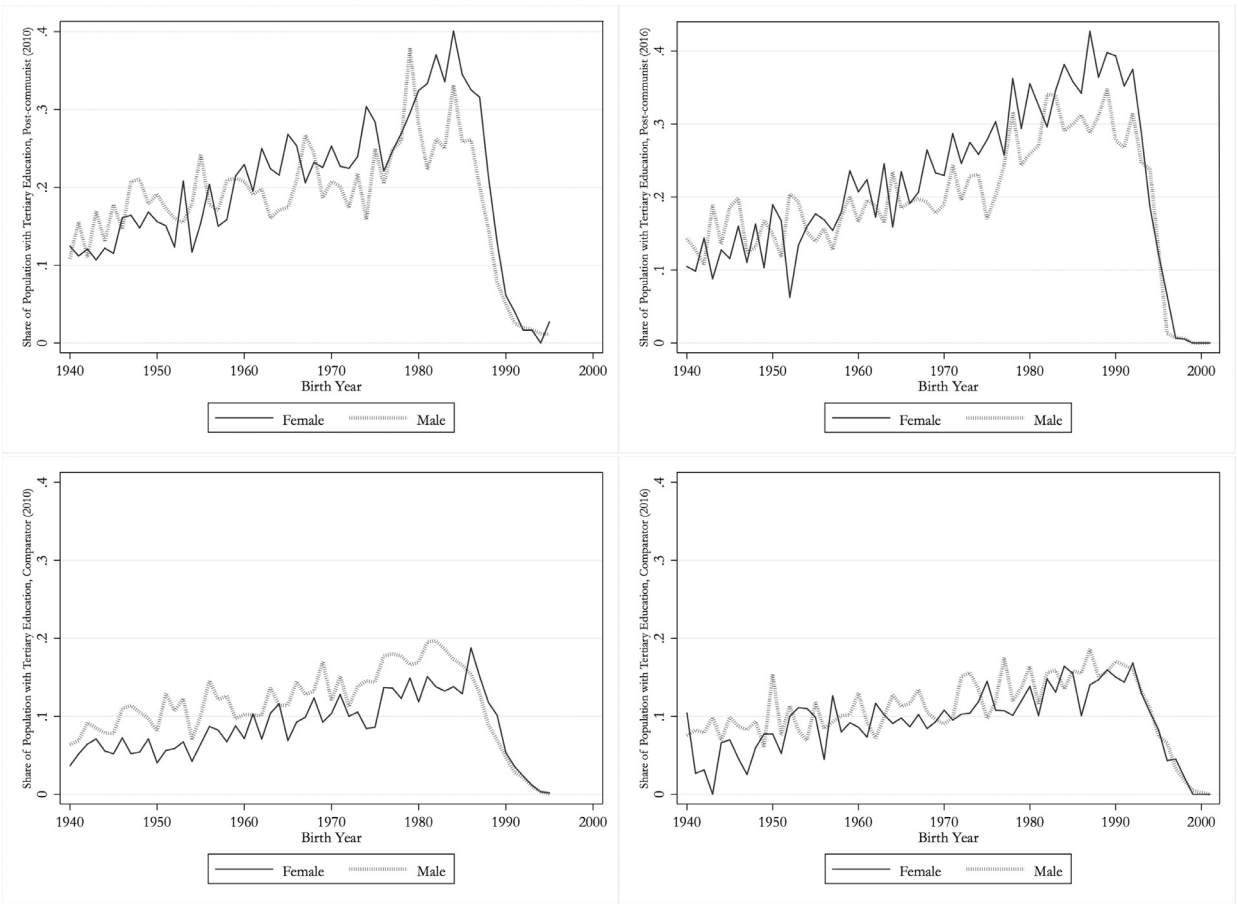

Fig. 11. The share of the population with tertiary education by birth year and gender, GWP. *Source*: Gallup World Poll and authors' calculations.

Notes: The solid line represents the share of the female population with tertiary education by birth year; the dashed line – the respective share of the male population.

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